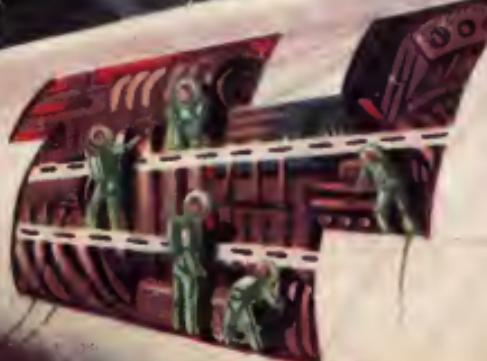


Authentic

SCIENCE FICTION MONTHLY

1'6

N°46



EMERGENCY! REPAIR CREWS
GO INTO ACTION

This month's
FEATURED NOVEL

SAVIOUR

Bryan Berry

Short Stories by: Dan Morgan

M. C. Woodhouse

Features by: G.B. Puttick. Pat O'Hara. Peter Summers

Authentic

SCIENCE FICTION MONTHLY

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H. J. CAMPBELL Writes...

QUITE a nice line-up this month, I think. Of course, I may be biased, but I expect you will soon let me know if I am! Even though the five stories are of very high quality, yet they introduce four brand new authors. I feel that these new men are going to make quite a mark on science fiction. Do you agree?

The novel by Bryan Berry is in the vein of truly modern science fiction that moves with the pace and tension of a first class thriller. *The Merchants*, by D. R. Davies, is an intriguing comment on the relativity of values. *Outside—Looking In*, by Ron Elton, is one of the rare pieces of science fiction humour that come our way. *The Higher Mathematics* is the first, we hope, of a series by M. C. Woodhouse dealing with the remarkable mind-children of his remarkable leading character. Those are all the new writers.

Keeping faith with the old and preserving the thread of friendly continuity is Dan Morgan with *Psychic Twin*. I tend to feel that this is Dan's best effort yet. It certainly indicates that he has found a place for himself in science fiction.

On the whole, not a bad collection, I would say. Then we have a nice range of non-fiction. Frank Wilson continues with his series on logic, showing us this time what it really means to infer. Pat O'Hara gives us some interesting material on robots and makes us realise that those in stories are not so fantastic as they sometimes appear. Peter Summers, in light-hearted vein, introduces us to some of the problems that may arise in the future. I, myself, give some data on the hydrogen bomb, which I hope will interest you. And, last but most certainly far from least, we have *The*

Expanding Universe—is it an illusion? by B. G. Puttick.

Now Mr. Puttick is a reader who answered my request for scientific articles for a competition (see Editorial No. 43) and whose entry is the best of those yet received. So, Mr. Puttick receives a year's free subscription to AUTHENTIC. You can have a shot yourself. Send me articles of 1,000 or 2,000 words, marked "competition." No text-book stuff and no encyclopedia rehashes. I want something into which genuine thought has been put.

I, personally, disagree with much of what Mr. Puttick has to say, but that is no reason why he should not say it, and as he has obviously put a lot of work into it, I see no reason why it should not be published. Less happily, there are one or two *factual* mistakes in his article. I am leaving them in so that you can test yourselves by trying to find the errors. Write and let me know. But this is *not* a competition and no prizes will be awarded!

By the time you read this, the Supermancon, Britain's first post-war out-of-London, National Science Fiction Convention will be over, but at the time of writing I am getting all

excited about it. Apparently the Manchester people, after a rather slow start, are racing in to a finish with dash and éclat. And it seems now that this will be a really fine show. I hope a lot of you attended, for it is only by the support of individual fans that these fan-organised conventions can survive.

I hear, too, that the young group out in Surrey are planning to hold a small convention next year, and are already searching for people to help. Anyone in that area—or out of it—who would like to come in on the ground floor of a convention should contact Colin Parsons, 31 Benhillwood Court, Benhillwood Road, Sutton, Surrey. Colin is the Editor of the fanzine FISSION, which came into being largely through AUTHENTIC, so I feel a certain amount of special goodwill towards this group!

You will see in the Projectiles section that a couple of other fan groups are starting up. Let us have more. Anyone, anywhere, who wants to start a group in his—or her!—area, just write to me and I will give the project publicity. All part of the service.

H.J.C.



*Maybe he could change man's destiny . . .
if he could penetrate collective consciousness.*

Saviour

by BRYAN BERRY

SCREAMING, they cut the blue sky of Earth into shimmery fragments with the fire-wind of their passing. And below them, like a mother, powerless to prevent the destructiveness of her own

children, great Earth trembled within her aged and granitic bones.

Unmanned, controlled by automatic devices within themselves, the robotplanes roared their thunderous way about



the globe, their bomb doors opening automatically to drop their imaginary atom bombs or to loose equally imaginary clouds of radioactive war dust or germ plasma upon targets that were nothing more, now, than areas that had once been controlled by the enemy.

The world's surface had been a ruin for a very long time; it had become a spawning ground for innumerable diseases and a fine—oh a *very* fine—place for war dust to settle and drift on and be blown upon by vast winds that tore at those places where Man had walked so confidently—and yet so blindly. Still, after so many, many years, the death dusts came. Like sulphur clouds they came, wind-borne, to hiss and sing and whisper over craters where once great cities had, with metal thunders of transport, with shrill stridency of factory whistle and with myriad other sounds, proclaimed Man's greatness to the identical skies in which the senseless aerial murderweaponsnowcavorted.

Here, over one certain ruin, above one particular area of craters and rubble, and whispering dust, a seekerbomb would swerve in its plunging flight, its built-in tracers catching the wave emanations of an

enemy'plane. Then this speeding metal arrow, gleaming with strangely iridescent beauty in the noonday sun, would flash upwards in careering, yet deadly, flight to slam with incredible force against one other, and very similar, sky-borne death-bringer. And then would come the inevitable bloodstain on the sky, as though some giant fiery sea-anemone had magically appeared and opened wide its tendrils of vermillion flame to grace this fine day for one brief moment before disappearing forever and forever in a rain of scattering metal fragments.

The air was still full of death, for the robotplanes were equipped with miniature breeder reactors that enabled them to replace, themselves, the fuel used up by their atomic engines. There was no need for these fliers to return to base to be refuelled; they had been constructed, most of them, more than two score years before and the newest was no younger than twenty years old. For they had been built to fight on after their makers had retreated elsewhere; they had been built to refuel themselves and lubricate themselves and repair themselves, and also, as best

they might, to keep themselves from harm and to cripple or destroy as many of the enemy 'planes as possible. The successful ones were still in the skies; the ones that had been destroyed lay crushed or crumpled or in their innumerable pieces the world over, like dead flies on a window sill.

The air was still full of death, and the seas were vast and green—and lonely, perhaps, without the vessels that had once, with great majesty, ploughed their surfaces. And the surface of the land was lonely, also, without the tramp of Man's feet upon it or the thunder of his machines. For, with the terrible spreading of the radioactive clouds, the land had become a place very far from suitable for warring infantry regiments—had become uninhabitable, in fact, for any form of life that was susceptible to hard radiation. Those that had survived the initial atomic raids had retreated to sanctuaries previously prepared. They had said good-bye to ocean and river and mountain and green valley and to forest lands; they had waved a final hand at the sky and the sun and the moon and the stars and had gone downwards and downwards to

great caverns and artificial worlds that had been laboriously built up over the long years preceding the start of the war, from the original atomic shelters.

But they had not forgotten the war.

As the underground cities were strengthened and added to and made to spread outwards and downwards, and as the people of these cities slowly adapted to a new environment, so the form of the war itself altered also. The aerial war, miles above them, continued, senselessly, but a new war started—an underground war, fought with great burrowing machines known as Moles, that, equipped with churning, whirling, atomic-powered blades and treads, grumbled and nosed their way through chalk and rock and limestone and shale alike, intent—as were their surface forebears, the tanks—on seeking out and destroying the enemy.

Hardly anyone, probably, remembered how the war had really started. It had been going on for so long that nobody could be bothered about causes; they just knew, of course, that—whatever had happened—they themselves

had been in the right and the enemy in the wrong.

In the skies of Earth the robot weapons flamed out their firework messages. And in a deep cavern city of Earth, below sterile soil, past rock and coal seam, past strata upon strata, deep down, beneath steel and durasteel and concrete roofings, in a certain dark tunnel . . .

He lay there in the blackness, not moving, his eyes still closed and with the last trace of the dream yet lingering in his mind as the last notes of a song might linger in the ear.

The surface, he thought, as the images drifted off and away to nothing. *I was dreaming of the surface.*

But *what* a dream! What clarity! It was as though he had actually been up there, miles above. He had almost been able to *feel* the bite of the dust clouds as they swirled past. And yet he'd never, of course, been up to the surface; never even seen visors of the surface war, since such things weren't permitted to any but high-ranking military officials like his father.

His father.

The thought jerked his dream from him and scattered it, piecemeal, into the

surrounding dark. And with the disruption of the terrifying, yet amazingly clear dream memory came the swift and far more terrifying return of reality, realisation.

He was lying on his back in the utter darkness of a disused freight transport tunnel on one of the Levels of the vast cavern city that was known as Deep London. He was tall and lean and dark, and he was eighteen years of age. More important by far—he was cold and very hungry, and had a twisted ankle. And the psychosecurity men were after him.

He tried to move his injured leg, winced at the pain and lay still once more. His eyes were open but the blackness above and about him was a complete blackness. He might have been lying, he thought vaguely, in a black fur cocoon. Or within his mother's womb, blissfully still and un-needful of movement, waiting in a huge dark eternity of peaceful, half-formed dreamings.

His stomach rumbled briefly, the sound seeming strangely loud in the silence. Hungry, he thought. I miss one meal and I get hungry like this. That's what comes of having the best of everything all my life. I've been well

looked after. Fattened up. Pig for the slaughter. Funny thing, remembering that phrase. Out of an old book. Wonder what a real pig tasted like? Before my time, all that, though. Hydroponics only nowadays. Remember Dad saying how good real beef was in the surface days . . .

Dad.

The strong, forceful features of the grey-haired man spun briefly in his mind and settled. Strength was in the face, yet there was kindness there also, but the kindness had almost lost the battle against the strength.

Had he been right to run? Right or wrong, what did it matter? They'd get him now, for certain. With a twisted ankle he couldn't hope to reach the old man's place before the psychosecs caught up with him. And what could the old man do for him, really, anyway? What could anyone do for him? Better to lie and wait until the security men caught up with him and then let them do whatever they wanted. After all, psychosurgery wasn't painful, and nobody who'd ever had it had ever been known to complain about it afterwards. Besides, they wouldn't do

much to the son of General Vane himself. Or would they?

The darkness was a cool and restful balm all about him.

He lay very still. But his mind was not still. He couldn't stop himself thinking and remembering.

It wasn't as if he'd ever *wanted* to be different. Because he'd been alone and odd and strange for as long as he could remember they'd looked at him and treated him as though he'd *planned* it that way. And that wasn't true at all. Anything but. Nobody *wants* to be cut off from other people. Nobody's ever given the chance to say what they want to be when they're born, and nowadays only a few get the chance to say what they want to *do* with their lives. It's all wrong. All wrong. And Mother was the worst of them all. If he hadn't thought exactly the way she wanted him to think then he was wrong, bad, a no-good, an idler, a dreamer, one of the come-to-bad-ends. And that catch in her voice she'd always managed to get when she talked to him about it. Faked. He was certain of it. She never had it when she talked to his father about him, and he'd heard them talking often enough. Oh, he'd had

no qualms about eavesdropping on them; he'd had to protect himself. That last time, for instance; the thing that had really started all the fuss.

He lay in the dark, remembering . . .

General Stephen Vane stood in the lounge of his chalet that nestled amid myriad others in the Luxury Level—as it was sarcastically termed by those who did not live there themselves—which was the lowest of all residential Levels of Deep London. He stood with his back to his wife, staring out of the window at the artificial daylight made by an artificial sun above.

Though neither the General nor his wife were aware of the fact, the small hatchway through to the kitchen was very slightly ajar. Even if they had known of this matter they would probably not have worried, since they did not expect their son to get back from the compulsory Saturday morning drill for at least another hour. In point of fact their son *had* come back, having volunteered for an unpopular task connected with sanitation, finished it speedily and been given leave to dismiss. Patrick Wellington

Vane now stood, poised and very silent, in the kitchen.

"I'm a soldier," said General Vane, rather gruffly, staring out of the window, frown lines clustered on his forehead. "I'm a soldier and, as you know, I'd always hoped that Patrick would follow along the same lines." He turned round abruptly and stared at his wife. "But I'm pretty certain that you've hoped so even *more* than I have. Isn't that true?"

"Perhaps."

"Admit it now, Laura."

"Well." The word was not an admission.

He made a movement with his hands. "What I'm trying to say is that while I've realised that the boy wouldn't be the slightest use inside a Mole or, in fact, in any part of the forces, you've closed your eyes to it completely. You've always wanted a soldier son—and an *officerson*, at that—and you're going to do your damnedest to see that you get one." He sighed and would not look her in the eyes. "I know your mind, Laura," he said. "I know the way it works. You've always held onto a certain set of standards, haven't you? Your idea is that breeding and gentility and education and so on auto-

matically make a man in a certain mould; make him a *better* man, in fact, than someone who hasn't had those advantages. No—" He raised his hand. "Let me go on. In some cases you may be right, but not always. We hear a lot about environment and heredity and such like, but that isn't the whole picture. When someone's born, that someone is a *new* thing, and when it gets older you can't just add its heredity to its environment and upbringing and expect your total to equal an actual human being."

He paused a moment, to let his ideas sink in. Then he said: "You see what I'm getting at? You can't expect that, because you married me and had a child and brought him up in a certain way, that child is going to be exactly what you would hope and expect him to be."

The General's wife lit a cigarette. "You're straying from the point, dear," she told her husband, calmly. "We're not discussing heredity or anything like it; we're talking about what we're going to do with Patrick. The boy's been right through training college without qualifying for anything. He's failed to get high enough marks to

qualify for any of the exempt posts in technology; therefore, he's got to go straight into the forces. I'm suggesting psycho-surgery as being the only way to make him fit to fight. Perhaps I'm wrong in thinking that he needs it, but I don't think I am. Anyway, they'll soon find out at the Psycho-centre."

A sudden intake of breath from the kitchen was too soft for the speakers to hear.

General Vane looked at his wife. "Is that really your reason for suggesting it?" he asked, slowly, very slowly, almost as though afraid to hear her answer, afraid of what he himself was saying—and thinking.

"Why else?"

"It couldn't be because—" the words were forced out, one by one—"because you think he'd fail the elementary and have to be downgraded to . . ."

". . . to Labour Duties?" she finished for him. "Well, what if I *was* thinking that? Do you think I could hold my head up again in this Level if word got about that General and Mrs. Vane's only child was too idle or stupid for anything but Labour Duties?" Her eyes blazed. "I don't see

what's wrong with my thinking that. It's only natural."

The General took out a cigarette case, looked at it and returned it to his pocket. "But—but psychosurgery," he muttered. "I know they're using it more and more now on ordinary people to adjust them to certain forms of work and help them over neuroses that started in their childhood, but . . ."

"But what?"

"You know what it's *main* use is, don't you?"

"Weeding out possible mutations, you mean?"

He nodded. "After the physical and mental freaks that were born of parents who got hit in the original surface radiation days, they've had to be very careful. Sometimes mental deviants don't show any noticeable differences until they're out of childhood."

"But psychosurgery at the right time can remove the deviation in some way, can't it?" Her voice was hard.

"Apparently. Sometimes. I don't know a great deal about it." He looked at her. "Are you trying to tell me you think Pat's a mutation?"

"I think he's particularly unfit for this form of society.

With total war and every able-bodied man needed in some field or other, to help in the general cause, there's no place for idlers who won't put their brains and their ability to any use whatever. His radical ideas about 'not seeing why he should have to take part in a war he didn't start' and 'why should he have any part in the killing of men he didn't even know, much less hate,' are enough to make me feel that psychosurgery is probably the only thing that will get him to fit into life. Isn't it better, for his own sake, that he should stop trying to fight things that are too big for him?"

He looked at his wife and shook his head slowly, almost wonderingly. "You're strong, Laura," he said, not without a certain admiration. "I suppose that's one of the reasons I married you."

Her shoulders moved in the slightest of shrugs. "I'm just trying to think what's best all round," she told him. "Pat has the ability to learn—his early training tests prove that. Also he's got a good mind. It's simply that he's developed wrong ideas, probably as a result of spending too much time on his own and brooding on problems that have beaten

men since—oh, since Noah, I should think."

She moved over to him, her face losing some of its harshness. "I suppose it sounds as though I'm a callous bitch," she said, gently, "but I'm honestly trying to think of the best answer. And psychosurgery seems to me to *be* that answer. Perhaps something *did* happen in Pat's childhood that's made him like this. If so then analysis would uncover it, and the psychosurgeons could probably put it right."

He didn't say anything.

"Well?" she pressed.

"I'm scared."

"That Pat's a mutant or something freakish? Oh, Steve!"

He shook his head. "No, not that. But this psychosurgery business has things about it I don't like. The mutant scare is one thing, but there's more to it than that. I don't know an awful lot about it, as I've said, but I've heard odd things . . ."

"Such as?" she wanted to know.

He took a breath and looked at her askance. "Well, psychosurgery itself, apparently, isn't *really* surgery as we think of it. It's the process whereby the psychos can somehow send

their patient's mind back to whatever happened to affect his life. They send him back to before the incident occurred and implant some sort of false memory which tells him that whatever *had* happened really didn't happen at all. If something like that is the trouble in Pat's case all well and good, I suppose, but . . ."

Perhaps the hatchway moved the tiniest fraction. If it did they didn't see it.

"Don't keep breaking off in the middle of what you're saying, Steve, for heaven's sake," said the General's wife.

"Well then, I'll try to explain. This mutant tracing scare, I'm told, is *really* a scare. Understandable in a way." He nodded quickly, as though to convince himself, more than his wife, that what he was saying was very true indeed. "But the point is that the balance of power in the Deep Cities has been shifting over the last ten years. Once the Military were the bosses, but now the psychos have developed this psychosurgery to such a degree that they, and not us, are really cracking the whips, since they can adjust practically anyone from whatever he was before into whatever is most necessary to the well-being of society. And

since a state of total war exists we're getting simply three sorts of people: fighters, technologists and general labourers."

"But surely, since total war *does* exist and these three types are necessary, it's better to have them than to have misfits who don't fit in anywhere."

He sighed. "I know, I know. Logically you're right. But I can't help feeling that it's wrong. And don't come back at me and start saying that because I'm a soldier I should think more logically and unemotionally than anyone else. I just don't like the idea of making everyone the same, no matter *what* the circumstances are. The world isn't always going to be kept under ground. Once the war's over and the radioactivity cleared away men will go back to the surface and start trying to build up a new life for themselves. A fine sort of life they'll build if we've removed, by this psychosurgery and so on, all strains but those leading to soldiers, technologists and general labourers."

"I'm not arguing about the future of the world, Steve," sighed the General's wife. "I'm simply concerned with my son's future. Is there anything about this psycho-

surgery that can possibly harm him?"

"Nothing that I know of, providing it is simply something that happened to him in childhood or early youth. But if not . . ." He caught his wife's eye and forced himself to continue. "If he's got any attributes of deviants that haven't yet risen to the conscious part of his mind but are still in his subconscious . . . Well, if they find them and think them serious it may not be so good." He swallowed. He wanted to stop talking because he didn't want to speak of this thing that he had learned quite recently, by chance. But his wife's eyes held him and he forced himself, as before, to go on. "Harry Lake. You remember Harry. Pal of Pat's when he was about nine or thereabouts?"

She nodded. "What about him?"

"You remember how friendly they were? Harry must have been the best friend Pat had, I should think. They used to go off walking together, and wouldn't mix with the other boys."

"I remember. Harry's father got moved to one of the west tunnel outposts, didn't he?"

The General nodded. "His son was reported killed when

the enemy crocked up those three Mole Heavies a month back."

"I'm sorry to hear it. Poor Mrs. Lake."

"Harry Lake was never in a Mole Heavy," said the General in a strange voice.

"Never in . . ."

The silence wrapped them in its sudden cloak.

"He never came out of psychosurgery. I only learned of it through overhearing something I shouldn't have overheard. He was *forced* to go to the Psychocentre by some psychosecurity man who found out something about him that he didn't like. The boy's parents didn't have any say in the matter at all, it seems. Anyhow, in he went. They put him under one of the analyser gadgets to find out as much as they could about his past, and apparently they found out more than enough. He was more than just different; he was a real deviant. And they wouldn't take the risk of giving him psychosurgery and then letting him go his own way."

Her eyes were very wide as she listened. From outside, from the steel and concrete streets of the steel and concrete cavern world, came the

muted whirrings of railcars flicking by the little chalet.

"What did they do to him?" she asked.

"They told his parents a cock-and-bull story about it being necessary to move him immediately from his parental environment and certain of his associates. Front line duty, they said, would be the best means of letting their psychosurgical treatment have the fullest effect in the shortest time. The Lakes couldn't argue with Psychocentre. They had to agree. And the next thing they heard about their son was the official report that he'd been killed in that engagement I mentioned. *But he wasn't killed in a Mole Heavy, because he was never allowed to join the Mole Corps.* He went into the Psychocentre and he never came out again."

"You're sure of this?"

He shook his head wearily. "No, of course I'm not sure. I wasn't *there* when they killed him or locked him up, or did whatever they did do to him. I'm just repeating something I overheard that may be a pack of lies or may have a grain of truth in it, or may be absolute fact." He started to pace the room. "If it's true then it's pretty terrible," he said, voicing thoughts rather

than speaking to his wife. "The logical result of circumstances, perhaps, but pretty terrible all the same." He stopped pacing and held up his hand, tapping his fingers to enumerate his points as he continued. "We come down here to continue the war and what happens? We have to adjust to a different way of life. Martial Law, state of crisis and so on. Right. We adjust. We alter the whole system of our society in order to make it fit into our changed conditions. We built electronic question and answer machines and fed them chock-a-block full of data regarding us, the war, the caverns, the enemy, the geological state of the surrounding rocks, everything. Then when we want an answer to a problem we put it to these Analysers—since their electronic brains have been stuffed full of all possible forms of man's knowledge and, therefore, their answers should be logically as perfect as anyone could wish—and we get our answers."

She didn't interrupt, merely listened.

"Very well," the General went on. "The mutant problem crops up and we give the Analysers data on that—everything we've learned so far. And because the Ana-

lysers have been constructed as machines to work during a time of total war, when self-preservation is the only thing, really, to be considered, they have been given data applicable to those conditions, and to no others. So when questions about mutations and so, on are put to the Analysers their answers come out in relation to the safe-keeping of the Western Federation Deep Cities. Naturally they told us to destroy the mutants. In a Utopian society a mutant would probably be given a chance to grow up, develop its powers, and then prove whether it was friend or foe by its actions. But in a state of total war, like this, risks can't be taken."

He took a deep breath. "And that happened years and years ago," he went on, more softly. "And ever since then the idea of destroying any sign of deviation from the normal has grown and grown, through the years. Once you had to be born with three arms, or some such thing, before they'd kill you. Nowadays they search your past, if they get the chance, to see whether you had mild hallucinations after drinking too much, or if you thought of flying in the air when you were six years old.

Any difference and they want to change it. And they *do* change it. They've got the power to do what they like to anyone, today, now that the Government Panel is flooded with these psychos."

When she saw that he wasn't going to continue she walked over to him and put her hand on his arm. "Steve."

"Well?"

"Have you heard any other tales like—like that one about Harry Lake? About people going into psychosurgery and not coming out again?"

"One or two. Rumours, perhaps. You can never tell." He patted her hand absently. "It's only recently, I suppose, that I've started thinking about it at all seriously. That posting back to the training camp gave me too much time to brood, I imagine."

"If you really think there's any danger of Pat . . . of . . ."

"Of his being a deviant too dangerous to live," he finished for her, brutally.

She nodded. "If you think that might be the case, then of course we don't want to suggest this psychosurgery business at all."

"I don't know," her husband replied. "I just don't know. Maybe we won't have

any choice in the matter anyway."

"What do you mean?"

"Well, if we don't put him into the forces and get him to go into General Labour the security people will be bound to smell something funny. Son of a general going into General Labour? Unheard of. You know the sort of thing. They'll be quite likely to bundle him off to the Psycho-centre straight away. And if he goes into the forces he'll have to take tests anyway, and the examiners will have complete reports of his previous record from the training college."

"But are the security people likely to see them?"

"Security men watch every testing for the forces and technological careers."

"Then what are we going to do?"

"If we put him in for General Labour he'd be safest, I should think." He forced himself to smile. "But we may be worrying about nothing, after all. If he's analysed they may find its just one of those—what do they call them—traumatic disturbances. You know, something that happened when he was young that's gone into his subconscious and started trouble. If

it's just a thing like that then matters won't be so bad. It was hearing about this Lake affair that started me thinking over the similarity between the two boys and so on, but it may have been just a surface similarity."

"But if the Lake boy was—well, too dangerous to let live, then why didn't people find out about it before? If deviants are dangerous to us they must *know* about whatever powers they've got, surely?"

Her husband shook his head. "Apparently that doesn't follow. A deviant might easily go right through his life possessing some extra, non-human gift, yet never know anything about it, consciously, and, therefore, be unable to control or direct it in any way. On the other hand he may know about it early on in life, or at any time at all, in fact. I'm no psycho, though. I don't know all the answers."

Suddenly she raised her hand, turned her eyes to the ceiling. "Just a minute," she said. "Hear something?"

"Sounds like water dripping."

She nodded. "I'd better go and look. I thought the plumber made a bad job of

that pipe. I don't want the bedroom carpet ruined."

The sound of the water dripping was obscured, momentarily, by another sound. A much louder sound that was something between a clump and a crash, and which came, it seemed, from the kitchen.

They stared at each other, bewildered, for the smallest fraction of a second. Then the General strode across the room and jerked open the communicating door. "Well," he said, softly, staring into the kitchen. "Well."

Swiftly his wife joined him and together they watched their son clamber to his feet. It was very easy indeed for both of them to see what had happened. The boy had had his ear to the hatchway, had heard them mention the dripping water and, in order to escape possible detection, had turned abruptly with the intention of darting out through the back door, which he had been cautious enough to open previously. Unfortunately for him, it was plain to see, his foot had caught on a torn piece of the plastiflooring when he made his abrupt turn, with the consequence that he had lost his balance and fallen.

"The pipe," murmured the General's wife, her eyes on her son. She pulled herself together. "I must look at the pipe." She went out into the hall and up the stairs.

The General regarded his son steely, yet with a certain sorrow also. "How long were you listening?"

Patrick Vane scowled and rubbed his leg. "Long enough."

"Not very nice, boy, to spy on your parents like that."

"Then why couldn't you say all that when I'm there to hear it? Why do you all have to keep plotting and planning behind my back?"

His father sighed. "We weren't plotting and planning, boy. You're our son and we love you. Also you're our responsibility until you're three years older than you are now. Besides, considering the things I was telling your mother just now it's only natural that we shouldn't want you to hear us. We're not sadists. I didn't want you to know about Harry Lake because . . . well, for obvious reasons."

Patrick looked at the floor near his father's feet. "Poor Harry," he said, softly. "Just because he was different from the mob, they decided to get

rid of him. *They decided!*" The words screamed out harshly in the little kitchen. "Who the hell are they to say whether someone should live or whether they should die? What damned right have they got to poke and pry into people's lives?"

"You must have heard me say that I just chanced to pick up this tale," the General said, quickly. "Likely as not it's a pack of lies. No sense in believing everything you hear."

"But *you* believed it," his son told him with conviction in his voice. "Or you believed it quite possible, anyway. If you hadn't you'd never have told mother about it. Don't forget I heard you talking about what the psychos were doing to people and how they'd got more and more powerful."

The General tried out a laugh that never came off. "I was just rambling," he said. "As I told your mother, this desk job I've had recently must have left me too much time to brood."

His son took a pace forward angrily. "Too much time! That's a good one. Can't you see that you've got things round the wrong way? Can't you see that it's because nobody has *enough* time to brood

that we're in this mess? We're conditioned to a state of total war; we're in a rut and we can't get out because we're being conditioned, all the time, to think that we *can't* get out. We're digging our rut deeper and deeper *ourselves*, most of us, and this psychosurgery business is not only helping the rut-digging in a very big way, but it's also trying to pull the earth at the edges of the rut down over our heads. If it keeps up this way we'll bury ourselves for good." He was hoarse and sweating when he finished.

"And you, I suppose, have the answer to all our problems?" his father murmured, not without sarcasm.

"I didn't say that," his son replied, speaking more softly now, the fanatical anger draining down slowly out of him. "I meant that I think the longer we go on in this way the less likelihood there'll be of anyone ever finding any more answers to anything." He looked the General straight in the eye. "I know I'm moody and difficult," he said, making this admission without any shame in his voice. "And I know that I've not been using my brain the way you'd both have liked. But why should I use it to help something that

I know, deep down inside me, is wrong?"

"You're trying to fight something that's too big for you, boy," the General said, quietly, watching his son. Behind him he heard his wife come down the stairs and along the hall to stand at his side.

"And you think it's wrong, then, to try and fight at all?"

"I didn't say that. This thing isn't a matter of right and wrong, anyway; it's a matter of a couple of people who love their son and don't want to see him unhappy or hurt or in any sort of trouble. And it's also a matter of a boy with ideals in a form of society in which such ideals, because of circumstances, can't be tolerated."

The harsh rattling of the front door knocker froze them, cut off all conversation.

With a murmur the General's wife turned and walked down the little hallway, thinking automatically, as she invariably did when the knocker's sound disturbed her, of tales her mother had told her of the pre-war surface days, when electronic voice-boxes would announce, in purring tones, the name and business of any caller. But all such luxuries were very much

things of the past in the Deep Cities, where armaments and basic necessities were the only things ever manufactured.

She opened the door swiftly. "Yes," she said. And then she shut her mouth abruptly and held onto the door lintel with a hand on which the knuckles showed up very white indeed.

The man in the black uniform bowed slightly, his smile easy and pleasant—or so one might think until one had seen how swiftly its owner could make it come and go.

Behind the man, stiffly to attention, stood two other black-uniformed figures.

She knew what they were. Anyone in the Deep Cities would have known.

She made her voice as steady as she could. "You're from Psychosecurity, aren't you?"

"That's right, madam. Captain Mathews, at your service. And you, I think, are Mrs. Vane?"

"I am. I expect you're here to see my husband."

His embarrassed cough seemed very natural to one who did not know how often it was used in just such circumstances as these. "Er—well, not exactly, Mrs. Vane. I've actually been sent to pick up your son."

There was nothing they could have done, he thought, lying on his back in the dark, shivering in the chill of the empty freight tunnel to which only a fraction of Deep London's atomically generated heat could percolate.

There was nothing any of us could have done. I wouldn't have wanted them to try, even, in case it made things bad for them, afterwards.

He recalled, with horrid vividness, the way the psycho-security man had saluted his father. After that had come the smiling explanations. Apparently he'd been due for psychoanalysis that morning but, owing to his having been dismissed early, he hadn't been told about it. The man was very sorry, of course, to come rapping on the door like that, but the General, being a military man, would understand how essential it was for things to be done at the right time. Oh no, the man didn't think there was anything wrong. Of course he was just a cog in the machine and didn't know why it was necessary for the boy to have instant analysis. Some little thing, perhaps, that analysis would bring to light? Certainly nothing to be alarmed about, so far as he knew. When would it be

over? Oh, probably within a couple of hours or so. It varied, of course. Anyway, if it took longer Psychocentre would certainly notify them both. Ready, Vane?

They'd made the journey up to the Administration Level in one of the lifts that were restricted to psychosecurity personnel, police and others on official business. The whole journey, from leaving the chalet to arriving at the grey, gaunt block of the Psycho-centre, could hardly have taken more than fifteen or twenty minutes at the most.

But then, thought Patrick Vane, in the darkness. But then you can think an awful lot in twenty minutes. You can think and you can wonder, and you can remember. Especially you can remember. And when you're scared and walking along with people who're more or less guarding you, or going up in a lift with nobody saying anything and you thinking that you're in the sort of trouble you won't be able to get out of, why, somehow it's easier to remember than when you've got all the time in the world.

Or was that because I sensed, in some way, that my only chance of getting away lay in remembering?

Patrick Vane didn't know.

But he recalled, very clearly, that journey. Especially the part when they'd been in the lift and he'd sat on a metal bench with the three men in their black uniforms sitting opposite him, watchful, pale-faced, waiting, perhaps, for him to show anger or fear or some such thing. And the lift had hummed its way upwards and upwards, hummed and hummed . . .

Different, he thought, listening to the noise the lift made as it rose up the long shaft, his eyes open but not seeing the three men who watched him so carefully.

Why was he different? And, more important than that, how was he different? Could it be possible that he, too, like Harry Lake, was sufficiently off the regular path to be considered potentially dangerous?

Harry Lake. Taller than he was, and broader, too. Lick anyone in the class if he wanted to. That time Miller tried to make everyone join him in a gang to take on the next class and Harry wouldn't join because he liked some of the chaps in the next class and didn't want to fight them. Miller said he was yellow. Shouted it out loud so that everyone could hear, and then Harry waded into him

and didn't stop until the rest of us pulled him off because someone saw one of the instructors coming. Tough, all right, but he never wanted to hit anyone because of it. Quiet and peaceful and good fun.

He'd got on well with Harry. Better than he had with anyone, really, ever since. Harry seemed to think about the same sort of things—and at the same time.

Yes, that was right. Think of things at the same time. It had been almost a kind of joke with them in the end, the way they'd both think of the same thing together. A private secret joke that they'd never let anyone else in on. Secret Service stuff. But how had they done it? If it had happened just once or twice it could have been coincidence, but it had happened many more times than that. Too many times for the word coincidence to apply. Far too many times. But when had it happened first?

He closed his eyes to think the more clearly. Under ordinary circumstances, he thought wryly, if he'd tried to remember something that had happened when he was nine years old or so he'd give it up as a bad job without even

trying. But this was different. Somehow he felt that he *had* to remember. And he *did* remember.

The picture formed in his mind. At first it was hazy and wavering, and in black and white and grey only. Then the fuzziness cleared as he concentrated still harder, and colours deftly took the place of the dull monotones. It was not until the picture was very clear and well-defined in his thoughts that he realised abruptly that it had not been thoughts that Harry and he had shared on that certain occasion, but far more than thoughts. And he realised, too, that that particular occasion had not really been the first time at all, but simply the first time he himself had been consciously aware of what had happened . . .

Nine years old Patrick Vane ran into the chalet through the kitchen door and threw his satchel into its customary corner. He was slightly more untidy and more scruffy than usual and his mother, busy setting the tea table, was swift to notice it.

"Patrick."

"Yes, Mum?" He struggled with his face in an attempt to force it into an expression of

innocence. He was far from successful.

"Patrick, you've got dirt on your face and your trousers are torn." She put her hands on her hips and faced him sternly. "Have you been fighting?"

Glad to be able to tell the truth, he shook his head vehemently. "No, Mum."

"Then how did you get yourself into a state like that, and why are you late for tea?"

He hung his head. "Been exploring with Harry," he explained in tones intended to be penitent.

"And I suppose you *have* to do it when you're wearing your best school clothes and you know tea's ready?" She shook her head in exasperation. "Where were you doing this—this exploring?"

Patrick said nothing.

"In those old transport tunnels, I suppose? Was it?"

He nodded miserably. It wasn't any use trying to lie when she'd got that sort of expression on her face. She always seemed to be able to catch him out and then things went from bad to worse.

"Really!" she said, banging a plastic cup down on the table fiercely. "You know that your father and I have forbidden

you to go near those old tunnels. They're dangerous. And Mrs. Lake doesn't like Harry going near them, either."

He scowled, then burst out: "But she's not an old grouser about it like *you* are! She just tells him to be careful and that's that; she doesn't keep on at him like you do at me." He put his hand to his mouth, amazed at his own impetuosity and, too, a little ashamed of having said such things. But now he'd started there was no going back. "He's not told off if he's a few minutes late for tea after school. He's still up in the tunnel, now, playing, but I had to come home because I knew you'd start on me." He was very close to tears. He felt his eyes beginning to smart and he blinked furiously so that she shouldn't see the tears start. *It's always like this*, he thought in angry frustration. *And it's not as if Harry's older than I am either. At least, he's not much older.*

"Don't you talk to me like that!" she shrilled at him. "Just because your father's away you think you can run wild and do as you please. You'd never dare say things like that if he were here. Now go straight upstairs to

your room and stay there. And take your satchel up as well, and get on with your homework." She was quivering and her voice, as she scolded him, had risen higher and higher. She pointed a shaking finger. "And don't ever go near those old tunnels again. Perhaps you don't care if they cave in and crush you to death, but *I* do, though I sometimes wonder why!"

Then it happened.

It was very sudden. Very sudden indeed. First he heard his mother's shrill voice talking of the possible cave-in of the old tunnels. Then, while his nine-year-old mind was sneeringly discarding all thought of such a thing ever happening, without warning, like waking abruptly from a vivid dream into an equally vivid reality, it happened.

He was *in* the tunnel. Seventy yards or so from the pallid ovoid of light that marked the exit towards which he had been heading, he lay. Pain was everywhere, it seemed, for the sudden fall of rock and mortar—loosened presumably by the vibrations of his own footsteps—had completely trapped him, and in the first instant of hysterical panic he felt that his entire

body was being squeezed and crushed and choked.

Then the blinding wash of agony retreated and became localised. And as that happened he realised two things. Firstly, that he was not entirely covered since he could still see the light ahead of him and could also move his arms. Secondly, that he was not Patrick Vane at all, lying there in the freight tunnel, the lower part of his body and both his legs held securely by the sudden fall of rock. No, he was not Patrick Vane but was, instead, Harry Lake. He was thinking with Harry Lake's mind and there was a picture in his mind of Harry Lake's mother warning him to be very careful if he should go playing in any of the disused freight transport tunnels.

It was swift to come and equally swift to leave. It was like hearing a single musical note that suddenly cuts off, leaving no reverberations behind and no echoes, so that you wonder whether you had ever really heard it at all.

His mind was working furiously. He knew his mother was still speaking to him because he could see her lips moving and her finger shaking at him. But he didn't hear what she was saying, or, if

he heard it, it made no impression on his conscious mind.

It hadn't been imagination. He hadn't *imagined* that pain and that fright. Besides, he had been thinking with Harry's mind. But how could that be? How could anyone think with someone else's mind?

He thought frantically, desperately, for a parallel. And found one. The games. The games Harry and he had played, when they'd discovered that they very often thought of the same things at the same time. They'd never told anyone else that they could do it. Other people wouldn't understand. This was something special and secret. One of them would think of something—anything—and the other would try to get *inside* his thoughts to find out what it was he'd been thinking about. It hadn't always worked, of course, but most times they'd been able to get pretty near.

And this last business about the tunnel had been something similar. Not *exactly* the same, but similar. This time it hadn't been just thoughts, but feelings, instead, that he'd got from Harry. And he'd left Harry back in the tunnel, because Harry's mother didn't

worry and grouse like his own mother did . . .

" . . . ill or something? Standing there like a ninny with your mouth open when I tell you to go upstairs to your room! Do as I tell you this minute!" Her voice was harsh, intruding jaggedly into the pattern of his thoughts.

"Harry," he said, in a voice that was a whisper, a groan, a sigh, all in one. "There's been a cave-in. The tunnel. Harry's trapped."

"What?"

He turned round and started for the kitchen, shouting over his shoulder: "I'm going to get the police and tell Harry's mother!"

The kitchen door banged to after him before Mrs. Vane had recovered sufficiently to let out her breath. "Well," she said, furious and bewildered. "Well."

On the kitchen stove the kettle, with insistent whistling, told all who cared to hear that it was boiling.

Patrick Vane, in the lift going upwards and upwards, nodded slightly to himself as he remembered. The rest of what had happened was not so clear in his mind as that first part, but it was clear enough.

He hadn't told the police or

Harry's mother or anyone about the very strange way in which he'd come to know of the cave-in and of Harry's being trapped. Some oddly warning sense had prompted him to say as little about it as possible. And his mother had never mentioned the matter afterwards, either, which had been just as well for him. Probably she'd been afraid to tell anyone about it for fear of being laughed at—or for fear that people might believe her and start to spread the tale that Patrick Vane was different from normal children—from which idea another, far more unpleasant, might spring so very easily: that Patrick Vane was different from *human* children.

He'd told Harry about it when the boy had come out of hospital, months afterwards, with his broken leg and his other injuries all mended. They'd tried to repeat the "feeling-sending" again, too, but they'd never been very successful with it when they'd really been consciously *trying* to do it. And there hadn't been much time, either, for such things, because soon after Harry came out of hospital his father had had his job changed and the Lakes were forced to move to another level.

And now Harry Lake was dead. Dead because he was—different.

Am I as "different" as Harry was? Patrick wondered, under the watchful eyes of the three black-garbed men.

Perhaps he was. Perhaps he was even *more* "different." After all, it wasn't as if the tunnel affair had been the only incident pointing to his peculiar abilities. It had simply been one of many such occurrences that, strangely enough, had never seemed all that important at the time. He'd grown accustomed to thinking himself odd and a bit apart from most of his school-friends and, whenever something funny had happened to him, he'd just accepted it as yet another indication that he was—well, that he was different.

And always, whenever anything happened, there had been that warning voice inside his head that had told him, whisperingly, that it would not be good to tell people, that it would be better by far to keep silent and let them think him just a normal person with nothing strange, nothing strange at all, to his character. It hadn't been the fear of having them disbelieve him and laugh at him, either, that

had caused the warning whispers. Of that he was certain. It had been something else, something deeper, something connected, perhaps, with the strange abilities themselves.

Strange abilities. He sorted them swiftly in his mind. There was the power of knowing what someone else was thinking—the guessing games with Harry Lake. There was the business of feeling and experiencing things as though you were someone else or as though—perhaps only for a fraction of a second—you could send that part of you that wasn't blood and bone and tissue and tendon out and away to rest in another person's mind.

But that wasn't all. There had been other things. There had been the time when his father had promised him a scootermobile if he passed through one of the training college examination with high enough honours. *Oh*, how he'd wanted that scooter!

He'd got it, too. Not by slaving and swotting, either, but by seeing, in his mind, the examination papers long, long before the test itself, and—as he learned by careful enquiries afterwards—long before the papers had even been printed. Once he'd known

what he was going to be asked it was not difficult to swot up on the necessary answers. Even the swotting itself hadn't been hard work. Somehow he'd managed to get a sort of picture of all the information he needed stamped on his mind just through scanning over the various textbooks. He'd been thirteen or fourteen, then.

He'd tried to work the same dodge again for later tests but had never managed it. The remembering things by just scanning through books hadn't worked again, either, except for odd instances that were really unimportant so far as his school work was concerned.

If there had been some pattern in the way these various talents had made themselves manifest he would have somewhere to search for clues as to what they were and why he, Patrick Vane, should have been cursed with them. But it was the fact that they had always taken him unawares, as it were, that baffled him. Their very erraticness was a problem in itself. Now if only . . .

He became aware, suddenly, of an intolerable silence. The humming of the lift that had been registering on his con-

sciousness throughout all his rememberings, had ceased.

The three men stood up. "All right, Vane," said the Captain.

The door of the lift slid open and slammed itself into its niche with a grinding of lattice-work. They had arrived at the Administration Level and—Patrick thought as he walked out into the light from the artificial sun above—it would take them but a matter of minutes to reach the Psychocentre.

Administration was similar to all the other levels of Deep London, insofar as the way in which it had been constructed was concerned. But there the resemblance ended, for there were no rows of tiny chalets here; there were no dwelling places at all, in fact, but only bleak concrete structures of great size in which were carried on all matters of government. Here was the Military Headquarters, there the Communications Centre, in another place the enormous building that housed the many electronic brains that, over recent years, had come to be the real rulers of the city.

A Security railcar was waiting for them when they came out of the lift. The Captain waved Patrick inside and

within seconds they were speeding off along the single rail that led, with very few windings indeed, to the Psychocentre.

It was then, in the speeding railcar, that Patrick Vane felt the first *real* fear.

Before, when he had been taken to the lift and while he had been inside it, travelling upwards, there had been wonder and bewilderment and anger, and the flood upon flood of memories through which he had been searching, in desperate haste, for reasons that he did not fully understand.

But now there was fear. Soon they would be outside the Psychocentre itself. Then they would hustle him out of the railcar and into the building. He would go through rooms and up stairs and along corridors and he would be confronted, finally, by an analyst, who would sit him down and ask him questions, and probably, with many remarks intended to set his mind at ease, put him under one of the mechanical Analysers, those monstrously indifferent machines that delved and probed and sought and recorded, and from which one had no hope, no hope at all, of ever hiding anything.

The vehicle purred im-

passively along upon its single rail. Within it, sitting very still, Patrick Vane, that very different young man, felt tiny terror tremblings and fear quiverings tingle over his body and down into his limbs. He pressed his hands hard against his knees so that the security men should not see the way they were shaking.

But why *should* he be frightened? He might come out of the analysis with flying colours. Or it might be as his father had been saying: something that had happened when he was a child that he'd consciously forgotten, yet which had imbedded itself in the unconscious part of his mind and set up a chain reaction of trouble. If that was so then analysis would reveal what was wrong and they would give him psychosurgery to cure it. He'd come out a bit altered, true, but then he wouldn't be aware of it, and he wouldn't experience any pain while the surgery was going on.

But somehow he knew that it wasn't just something that had happened when he was a child. Somehow he knew that it was more than that, and that the analysts wouldn't like it when they found it.

And there was no chance of keeping anything back from a mechanical Analyser. He'd seen visor pictures of how they worked.

He saw himself, then, as he would be once they got busy on him. He'd be sitting in a chair, shot full of drugs, the squat bulk of the Analyser in front of him and instruments fixed all over him to record the slightest physiological changes that might result, during the analysis, from the mental conditions brought about by the Analyser's questions. He'd be asked, in mechanical and dully indifferent tones, all manner of things and he'd have to answer because of the drugs they'd have given him. He'd be given tests of all kinds and the Analyser would go back and back into his past life, the way a Mole Heavy would plough on and on through strata upon strata of rock, blades churning, on and on . . .

He sat sweating in the car and tried to force the picture he had conjured up to vanish, to become no more. There was no sense in wasting time and emotion in thinking about what might happen in the future. Better to think back, as he had done before. Far better. Why was it better? He

didn't know. Yet something in his mind that was no more than the faint echo of a whisper seemed to tell him that through remembering might come—escape.

But how could such a thing be? How could memories aid him in this dire predicament? How—if he were truly so very, very different—could anything aid him? Harry Lake had been different, and Harry Lake, so it was rumoured, had been put away, or perhaps even killed, because of his strangeness.

The railcar whirred to a halt.

Think! shrilled the voice in Patrick Vane's mind. *Think back. Remember. You've got to remember, yourself, now, before you get under the Analyser. Because you'll remember then, all right, and then it will be too late.*

"Here we are," said the captain, smoothing his uniform. "The Psychocentre."

They got out of the railcar and stood in the shadow of the towering building. "Up the steps, Vane, if you please," said the captain, gesturing with a black-gloved hand.

Think back! Think back! the voice pleaded.

"Through this door, Vane."

How could he remember when he didn't know what incident, what odd and for-

gotten occurrence, was the *right* one? When had it happened, anyway, and how could it help him, now, even if he were able to bring it to mind before he reached the analyst's consulting room?

They came into a room, the four of them, and crossed to where several men were sitting at a wall-length desk. "Captain Mathews reporting with Patrick Vane. He's due for analysis."

One of the men ruffled papers on his desk, peered at varied documents, peered at the captain, peered at Patrick Vane. "That's right," he said at last. "Vane. Patrick. Psychoanalysis."

Think back. Remember!

"Take these," said the man at the desk, handing papers across to the captain. "And these." More papers. "Dr. Naylor is handling this one. Top floor. Room nine."

"Right. Come along, Vane."

How old had he been when whatever it was had happened to him? Patrick wondered, moving off again, this time with only the captain for escort. He must hurry. He must remember before the Analyser made him remember. Had it been something that he had done or something that he had seen? Had anyone

else been there when it had happened or had he been on his own? How old? Where? What? How? When? Pictures flashed in his mind like a speeded-up visor film. He was seven years old, sitting in class with the instructor's voice droning on and on in his ears, but he wasn't listening because he was seeing something in his mind. He was seeing his father getting out of a Mole Heavy and walking into a boundary outpost mess and packing his kit, and Patrick knew, quite definitely, that his father was coming home. The next day General Vane *had* come home on four days' unexpected leave.

But that didn't help. That wasn't what he was searching for. Nor was the memory of the time when he'd had a little plastic model of a robotplane given him on his birthday, and he wanted so much for it to be a *real* robotplane that would really fly like the ones that filled the skies miles above his head. And one night, the night after he'd been given it, alone in his room, secretly, he'd willed and willed that the 'plane might fly for him just once, just this once. And lo! Like a plastic, soaring butterfly, as in some magic childhood dream, the toy had moved like a live thing, had

risen on its tiny plastic wings, risen and risen to soar and bank and glide and dive about in the tiny enclosed sky of Patrick Vane's bedroom. Hunched up on the bed, clasping himself in ecstasy, wide-eyed, Patrick had watched its enchanted flight until footsteps had sounded on the stairs and the robot-plane had settled to rest, and Mrs. Vane had stood in the doorway demanding to know why Patrick was sitting up in bed with the light on when he should have been sound asleep. When he'd told her about the toy 'plane she'd laughed and said that such a thing could never happen because a toy was a toy and couldn't be made to fly about the room and, therefore, Patrick must have dreamed it.

He hadn't been able to make the toy fly about after that, and as he had got older, he'd come to accept the fact that his mother had been right and that it all *had* been a dream.

And that memory didn't help him. It wasn't what he was searching for, of that he was certain. There was something else, Something else.

They went up in a lift to the top floor. When the lift door opened Captain Mathews

pointed down the corridor. "Down here," he said, briefly.

Patrick noticed the numbers on the doors as they walked past them. Twelve. Eleven. Ten. Nine.

They stopped. The captain rapped on the door.

Remember! Remember!
Only a few minutes left!

The captain rapped more loudly. There was no answer. He waited a couple of seconds more and then grasped the door handle and pushed. The room was empty. It was not the actual consulting room, but a kind of waiting room, Patrick realised. On one of the walls there was another door that would lead through, presumably, to the consulting room itself"

"Perhaps he's in there," murmured the captain, half to himself. "You sit on that seat over there and I'll investigate."

Patrick sat down and the captain opened the communicating door and peered into the far room, which also proved to be empty. "Stay there," the captain said, shutting the door and walking across to the one that led out into the corridor, "while I find out where the doctor's gone."

A few moments' more grace. Try to remember. Try to think back.

From outside came the sound of voices. The captain was asking someone—a girl—where Dr. Naylor might be and the girl was replying that she thought he might have gone to lunch and that if the captain would go with her she'd be able to find out for him. Footsteps and voices faded off down the corridor.

A nurse, probably, Patrick Vane thought. Nice voice. Wonder what she looks like. Voice something like Margaret's. Probably nothing to look at, though. Not as good as Margaret, anyway.

Margaret. Long blonde hair tied up roughly behind her head. Tiny, slim body. Big eyes and wonderful lips that had a kind of pout to them that only made them all the more attractive. How long had he known her? Four weeks? Five? Just during that holiday from training college a year and a half or so back. Lovely girl. She'd understood him, somehow. Seemed to know the way he felt about things without his having to *explain* everything. Not like most of the fluff-headed girls he'd met at dances. She was different.

Different. Margaret. Knew the way he felt.

He went through the

sequence like a swordstroke through empty air. It was as though a jack-in-the-box, caged down, trapped and immobile within some secret compartment of his mind, had been suddenly triggered off and released, with a great whirr and a vast springing upright to wave and bob at him and make him wonder and be amazed at the fact that such a thing could ever have escaped his notice . . .

"Won't be in till late, Mum," he said, making his voice as casual as possible, wanting very much to be out of the house.

Mrs. Vane looked up from reading the latest letter that had reached her from her husband at the boundary. Her eyes flicked, as always, from Patrick's shoes to the top of his head, critically.

He looked airily out of the window, not wanting to meet her gaze, knowing that if he did so he would have to look away, and that would only make him cross and he didn't want to be cross.

"I really don't see why you have to wear your oldest clothes when you're going out, Patrick," she said, her tones icy. "You've got two perfectly good suits upstairs, yet

these days you seem to like gadding about in rags as though you were a tramp."

The word was an archaism left over from surface days. There were no tramps in the Deep Cities. Deep City society would not tolerate them.

Patrick sighed. There was no use in trying to explain to her. If he told her that he was going to spend the day up in the General Labour Level where he'd made some friends she would only be shocked and start lecturing him about the way in which a General's son was supposed to behave and the social dignity he was supposed to possess. And if he told her that he'd got a girlfriend who worked behind the counter at a General Labour canteen she'd have had even more to say. He wore old clothes when he went to meet her because, for one thing, he liked the feeling of comfort and the consequent lack of false dignity. Also, he didn't want to look conspicuous by wearing Luxury Level suits in a General Labour Level canteen. He'd tried, once, to explain this to his mother, but all he'd got in return for his efforts was a rather sneering laugh that had been intended, he presumed, to dissuade him from

thinking that way and to show him what sensible people thought of such things. After that first time he'd been careful not to give her the opportunity of laughing at him.

He shrugged his shoulders very slightly. "I like wandering about during the holidays," he said, by way of explanation. "And it seems silly to wear good clothes for that sort of thing. They'd only get dirty. If I wear old clothes like these it doesn't matter." The lie came easily to his lips. At one time he'd always tried to tell her the truth, but once he'd started to realise how many arguments and scenes resulted from it, he'd stopped. It just didn't seem worth it. You told the truth and she flew into a rage and started scolding or—worse still—she got that catch in her voice and that look in her eyes that told you very plainly that she was going to pull the hard-done-by-mother-with-a-good-for-nothing-son stunt. The first few times had made him feel ashamed, but when she tried it more and more frequently in an obvious effort to change him from what he was into what she wanted him to be—well, he'd grown callous.

He walked over to the door. "Bye," he said, not giving her

time to make an argument out of what he'd said.

"Don't be too late," she called after him.

He didn't bother to answer her. He'd heard the same thing on so many, many occasions that he'd grown to accept the fact that she'd say the same thing, whenever he went out, for as long as he lived in the same house. To her he was still a baby. Still a private, personal possession. It would never make any difference how old he was; to her he'd still be a baby with wrong ideas that it was her duty to correct, because they were different from her own. The fact that in a year and a bit he'd be old enough to be thrown into a Mole Heavy and sent out to fight in order to protect her and everyone else didn't matter a bit. Would she think enough of him to try to help him get out of the fighting when he was eighteen? Never. She'd been conditioned to accept the war; it was part of her life.

He gave himself a mental shaking. To hell with it all! He was going to meet Margaret; he'd got a few credits in his pocket and he'd got the whole day and the evening in front of him with no one to tell him what to do.

The General Labour Level contained both residential and entertainment areas, and it sprawled over a very wide region. Since all power came from the vast atomic generators on the Lowest Level there was no smoke and no haze, and you could see for great distances.

He made his way swiftly to the canteen, which he knew would be almost empty at this early hour of the afternoon.

He'd gone there first some weeks before, at the start of the holidays. He'd been wandering round all the Levels, looking at places and people, and the way life went on on Levels other than his own. And he'd gone into the canteen for a cup of coffee—or for a cup of the chemical brew that was called coffee in this age of synthetic foods—and he'd seen Margaret. He'd been in there sitting up at the counter, drinking countless coffees, for an hour and a half before he'd plucked up courage to talk to her.

Since then he'd come up once or twice, or perhaps more, every week, to talk to her. And he *could* talk to her. Not since he'd known Harry Lake, years and years before, had he been *really* able to

talk to anyone until he'd met her.

He pushed open the doors of the canteen and went inside, his eyes darting at once to the counter in their automatic search for Margaret.

She was there, in her white uniform, her hands busy with urns and plates and plastic cups. The bright banks of ceiling lights streamed down their rays especially—or so it seemed to Patrick—to catch in the gold of her hair and make it flash and softly glimmer in the way that perhaps the *real* sun might glimmer miles above.

"I've got the afternoon off," she told him when he reached the counter. "Doreen—that's the other girl—wanted tomorrow afternoon off, and as that was due to be mine and I knew you'd be coming today, I changed with her."

He hadn't bargained for that. He'd imagined he'd be in the canteen for most of the day and had only brought out enough credits to pay for coffees and perhaps a meal later on, so he couldn't very well take her out to anything expensive. He explained his position to her, awkwardly and with many pauses. It was difficult, when you were a student with a meagre allow-

ance, to know how to deal with a girl who earned her own keep and was older than you were.

Margaret laughed. "It doesn't matter, silly," she said. "I'd just as soon stay here and talk. We can take our coffees over to one of the tables out of the way of everyone. I've just been helping out behind here till you arrived."

He felt his heart leap, because he knew that it wasn't just a line. She really *would* just as soon sit and talk to him as go out somewhere. He didn't know *how* he knew this, but know it he did.

Within minutes, then, she had taken off her uniform smock and was sitting opposite him at one of the tables at the far end of the canteen, and there were two cups of steaming coffee between them, and life was a very wonderful thing indeed for Patrick Vane.

They talked, the two of them, throughout the hours of the long afternoon. They talked and they drank coffee, and they looked into each other's eyes, and to them, because they were alone and together, the hours were like minutes and the minutes had become, by some insidious, magical means, no longer than

seconds. They spoke of themselves and their pasts, and their probable futures. They spoke of friendship and love, and sex and society, and of all manner of things, both abstract and concrete, and they were able to speak honestly to each other because they knew, both of them, that what they said would not be misconstrued, nor derided, nor sneeringly repeated to others afterwards. It was a conversation such as really comes to pass between a young girl and a younger youth, because there was a total absence of conflict and of tension. It was as though their words were weaving a tight web about them both and drawing them ever closer with each sentence spoken, with each thought transmitted and received.

They told of their lives and their thoughts, and their desires. They spoke of things that they had done and thought and said, and—most of all—desired; things that they had never thought to tell another living soul. And each found that the other understood and did not condemn. Sometimes this was because the other had had similar thoughts or had done similar things, and sometimes it was because the other could *see*, in

some strange way, into their companion's mind and thus understand the reason for the thought or deed or longing. And they knew, these two at the canteen table, talking away the afternoon, that only through understanding and never through condemnation, could a bad thing be made good, or a strange thing made acceptable.

"Another coffee?" Patrick asked.

She shook her head. "I haven't finished this one yet," she told him, sipping from her cup.

He leaned back in the chair and watched her. "We're very much alike, you know," he told her. "That business you were telling me about, making the ball bounce up and down in the playground, when you were five years old or so, without touching it, just to make the little boy frightened."

"Well?" She eyed him over the rim of the cup.

"Like me and the toy robot-plane. Moving something about with—well, with your mind, I suppose."

She set the cup down. "Yes, it's the same sort of thing. And, like you, when I told someone about it they told me I shouldn't tell fibs and that I

must have been making the whole thing up."

He nodded, remembering the plane and the way his mother came into his bedroom. It was very vague in his mind, but he could recall enough of the incident to see that the two things were very similar. The girl and a bouncing ball that she wanted to bounce up and down to frighten a little boy who was trying to pull her hair. The boy with a toy robotplane that he wanted so very, very much to behave like a real one. Both of them told, afterwards, that the incidents could never have occurred. Both winding up by accepting the incidents more or less as being dreams of some sort.

"I've never been able to do it again," she told him, putting the cup down on the table. "Never."

"Because, perhaps, like me, you'd grown up with the idea that it must have been imagination or a dream, because a grown-up said so." He pointed a lean finger at a spoon that lay between them on the table. "Try on that," he said, "and I'll try and help you do it. Just an inch off the table. We don't want it sailing all over the place. Just an inch."

If he could get inside her mind, he thought swiftly, he

might be able to add whatever gifts he'd got to her own. There might be a way of forcing her to bring into play whatever ability she had. He'd done it before. At school, mostly. Like that time he'd hero-worshipped Claydon, the cricket captain, and made him score that century against the Third Level first eleven. He'd done it by *willing* the boy to use his eyes and his muscles, and his judgment. Perhaps he could do it with Margaret. He *had* to do it with Margaret.

"That spoon?" Margaret asked, nodding at it.

"That one," he agreed. "Try it, will you? Just to see if we can do it?"

"Just an inch?" she asked, her eyes flicking round the nearby tables as though expecting all eyes to be upon her, watchful and questioning.

"One inch," Patrick Vane agreed. "Ready?"

She nodded.

Patrick thrust out his thoughts and his powers towards the golden-haired girl who sat opposite him. He was not occupied with thoughts of the spoon at all, but only with the fact that the girl *should* be able to move it and that he himself could *make* her move it.

The spoon lifted, wavered,

remained suspended and held as though resting on some invisible surface one inch above the plastoid table.

"Down," breathed Patrick Vane into Margaret's mind. "Down."

The spoon settled with a very faint sound.

They looked at each other for a long moment, not speaking. From the counter, behind them, came the rattle of plates and cups, the murmur of voices, the hissing of the urns. From somewhere to their left came the squeak of a chair on the plastoid floor. Still they were silent, the memory of what they had accomplished vast and burning, and not a little frightening, within their minds.

"Excuse me." The voice came suddenly to their ears, and the dark bulk of the voice's owner loomed, equally suddenly, over their table. He was an elderly man with a grey growth on his chin that was neither entirely a beard, nor yet just the result of not shaving, but was something indeterminate between the two. He was tall and gaunt, and dressed in ancient coveralls that were both greasy and tattered. "Excuse me," he repeated, softly. "Hope you

both don't mind my talking to you like this?"

It wasn't so much an apology for intruding, as a simple statement of fact. Patrick looked at his face closely, thinking that perhaps he'd seen him somewhere before. With something of a shock he realised that he *had* seen him before; it had been there, in that same canteen, quite frequently, sitting alone in a corner and not talking to anyone, yet, somehow, not seeming lonely or different from the usual clientele.

"I just happened to be sitting over there"—the man gestured vaguely with his thumb—"and I saw what you were doing."

Patrick sucked in his breath. He'd been certain that there'd been no one near enough to see them. *Certain!*

"One day," the man continued, "you might need help because of—" he waved briefly at the spoon, "—because of things like that. If you ever do, either of you, then look me up." He looked at them both very steadily, very calmly.

Patrick swallowed. His throat had gone dry and his body had stiffened and tightened up from the moment the man had started speaking.

He'd been so sure that there had been no one watching them that his initial surprise had prevented him from paying attention to what the stranger had said. He blinked. "Need help?" he said, vaguely.

The old man nodded. "You might do," he said. "Never can tell. Being able to do things like that there trick with the spoon won't make you popular, you know. Maybe there'll come a time when you'll need advice or something. If you ever do, either of you," his eyes flicked to the girl, "the name's Whittam. George Whittam, 1495, Level Four." He shook his head when he saw Patrick reaching into the pocket of his coverall. "No, don't write it down. Just keep it in your head. One four nine five, Level Four. And you can both forget you ever saw me—unless you need that help I was talking about."

"One four nine five, Level Four," Patrick repeated.

"That's right." The man put his hand briefly on Patrick's shoulder as he moved away, pressing it with friendly strength. And then he was gone.

Awareness of the place and the time and the situation returned gradually to Patrick, like water seeping slowly up

into a sponge. He felt the hardness of the chair beneath him, felt the cold, smooth surface of the canteen table on which both his hands were pressing with a force that surprised him. He heard, now that the stranger had left, all the myriad sounds that filled the canteen: the noises from the counter, the scraping of chairs, the faint rattle of spoon on plate, the odd words that floated out to him from various distant conversations like pieces from numerous verbal jig-saws. And he grew aware of Margaret, too, sitting opposite him, not speaking, looking now at his face with odd, bewildered gaze, and now down at the table—at the spoon.

"What did he mean, 'we might need help'?" Margaret asked. Her tone matched the look in her eyes.

Patrick shook his head. "I don't know," he replied, slowly. "I don't know and I don't think, somehow, that I *want* to know." He stood up abruptly. "I'll get some more coffee," he announced.

When he returned from the counter with the two brimming cups and looked into her eyes he knew that she didn't want to talk any more about what had happened. And he

knew, also, that she could read the same thing in his own face, his own eyes. They did not have to speak to each other to learn these things.

The old man, with his strange arrival and his casual offer of help, had put a fear into their minds and into their hearts, and it was the same fear within both of them, and because they were these two special people, Patrick and Margaret, they did not need to speak of the fear in order to share it the more fully.

All through the holiday he came up to see Margaret several times a week, but when the holiday was over he could only get away from his own Level on Saturdays. Then he went down with 'flu and couldn't visit the canteen at all. And when he recovered and went up to the General Labour Level on a Saturday evening to find her again, he was told that she had left. No, the manager didn't know where she was working now. She'd left suddenly because her father had died and she'd had to look after her mother. No, he couldn't give her address unless Patrick was a relative, which, of course, he wasn't.

He looked for her but he never saw her again. He

walked the streets of the upper Levels whenever he could get away from his own home, walking and seeking with a great ache and a great loneliness inside him that pulsed and throbbed like some strange secondary heartbeat, deep within.

But the days changed to weeks and the weeks to months and the great flowing onward of time dulled down the pulse of grief to dimness, to pallid echoings of what it once had been.

He went to the Labour Level less and less, then, and when he did it was only to think of Margaret and hear her voice again in memory, and walk the streets where once, so short a time before, they had strolled together. It was then, and only then, that the old grief and the old heart-break would return and he would mourn his loss as only those can mourn who love and lose for the very first time. And it was not of the lifting spoon and the strange old man that he thought, but only of Margaret and the way her hair had shone and the way her voice had sounded. The bond that had held them so close together and had enabled each to understand the other became, in his mind, trans-

formed from a thing of strangeness into simply a thing of love. It had been their love that had held them in that tight web of mutual understanding, or so it seemed to Patrick, looking back. The real strangeness of their union became lost in the folds of memory of Margaret herself, and the incident of the lifting spoon and the gaunt old man in the tattered coverall who had offered to give either of them help if ever they should need it—these things, all of them, faded out from his mind because they were so much less than the memory of lost love. Faded out, until . . .

He came out of it with the girl's voice still in his ears, faint, now, as she walked down the corridor outside, saying: "This way, Captain." The voice that was like Margaret's voice. The voice that had sparked the fuse of memory that had led, through realms of unconsciousness, to that particular bombshell of remembrance.

He jumped to his feet and stood, dazed and bewildered, in the waiting room. He'd found it! He'd remembered the incident right through from start to finish, the

incident he'd *needed* to remember!

The picture of the old man was clear and vivid, and the words he had spoken were clear in his mind, also. *Maybe there'll come a time when you'll need advice or something. If you ever do, either of you, the name's Whittam. George Whittam. 1495, Level Four. No, don't write it down. Just keep it in your head.*

But how had he known? How had he suspected that, in the future some time, either of them might need help? Had he guessed that they were sufficiently different to be classed as dangerous, if ever their peculiar talents were discovered?

But there was no time to think of the means whereby the stranger had known or suspected. The fact that he had given a name and address and had offered help was the only thing that mattered. *Maybe there'll come a time when you need advice or something.* Well, that time had arrived. He needed both help and advice, and he needed them as quickly as possible.

He did not allow himself time to think of the enormity of what he was doing. He did not stop to consider the consequences of disobeying the

orders of the Psychosecurity men, nor the enormous odds against his ever reaching Whittam. If he let himself hesitate he would be lost. He must get away as soon as possible. Immediately. Now!

He opened the door and stepped out boldly into the corridor. A man in a white coat was walking towards him.

Be brave, be bold, a steady-ing voice within Patrick's frightened mind advised him. He smiled at the man. "Excuse me," he said, "I've just finished analysis with Dr. Naylor. He went off to lunch, I think, and told me that someone would come up to show me the way out, but nobody's been, so I wondered if you could . . ."

"Of course," the man nodded, happy to oblige, pointing down the corridor. "The lifts are just down there, on the right hand side."

"Many thanks," said Patrick, setting off, his legs feeling boneless and jelly-like, wobbling and incapable of bearing his weight.

At any moment he might see Captain Mathews stepping round the far turn in the passage, or from the lifts, perhaps. At any moment he might hear some dread voice behind him saying: "Just a

moment, young man. Where do you think you're going?" And if he didn't turn round, if he didn't stop, then the voice would change in tone and the words would be: "Hey, you there! Stop!"

He reached the lifts with the sweat sticking the clothes to his body. The little winking indicator lights told him that one lift was coming up and the other—luckily—stationary at his own floor. He pulled the doors open, stepped inside and pressed the toggle down the slot, having shut the doors behind him, to the notch marked "First." If he went straight down to the ground floor and tried to walk out through the main hallway he'd almost certainly be stopped by the clerks, who would have noticed him come in with the security men. Better to get to the first floor and then try and get out by some other method.

He remembered other Adminstration buildings that he'd been in in the past. Generally the first floor contained the storerooms, and an outside freight lift ran from them down to ground level. And nearly all Admin. buildings were, he knew, built along the same lines; if this one was no exception to the

rule, and if his luck and his nerve held out, he might stand a chance of getting away. There were too many "ifs" in the scheme, he knew, but it seemed the only possible method of getting out of the building. And he *had* to get out!

The lift stopped. Swiftly he mopped sweat off his face with a handkerchief. Be brave. Be natural. Act the part.

He opened the door and stepped out, forcing his jelly legs to do his brain's bidding.

After perhaps two minutes of swift, though not too hasty, walking and searching without being challenged, he found that his guess had been a good one. The Psychocentre was similar in design to all the other Admin. buildings he had known—it had a general store-room on its first floor and the storeroom had its own freight lift.

He walked boldly across the room between plastoid crates and tiers of shelves towards a table at which a middle-aged man—presumably the storekeeper—was sitting with an open magazine in front of him.

"Ah," said Patrick, as though he had at last found the person for whom he had been seeking. "Excuse me."

The man looked up. "Well, young man?"

"Are you the storekeeper?"

"I am."

Patrick leaned over the desk, becoming confidential. "I wonder if you could do me a favour," he said. "My father's one of the doctors here. His name's Clayton, but he's new here, so I don't suppose you'll have heard of him. Anyway, I came to see him and apparently he's not allowed to have visitors during working hours. I got in all right, but he asked me to ask you if you could let me out in the freight lift, as there's a whole party of security men in the front hall who'll make a fuss if they spot me and find out my Dad's been having visitors."

The storekeeper scratched his head. "Well," he said, not unkindly, "I shouldn't do it, you know. This lift's supposed to be for freight only."

"Oh, please," urged Patrick, expecting the door to burst open behind him, expecting Captain Mathews' voice to ask him, with steely politeness, where he thought he was going, expecting the sound of running feet, the feel of heavy hands on his shoulders. "Please get me out this way. I don't want my Dad to get

into trouble because I've been here; he might lose his job or—or something!"

The man softened up the lined hardness of his face into a smile. "Oh, all right, then," he said, getting to his feet. "But don't you let on to anyone that I did it, or it might cost me *my* job." He moved to the lift and swung the heavy lattice doors to one side.

"I won't tell anyone. Thanks an awful lot." He stepped into the lift and the storekeeper followed him, slamming the doors after him and pressing the single button on the control panel. The lift moved down.

"Here we are. Now cut away before someone sees you and comes over to ask me questions." The man waved Patrick's thanks aside and, within a minute, was gone back upwards in the slowly ascending cage of the freight lift, and then Patrick was alone, the first lap of his flight successfully completed.

He was in a kind of yard into which several monorails converged. Opposite him was another tall Administration building and between this and the Psychocentre itself ran an alleyway.

He stood motionless for a moment or so, getting his

bearings, recalling where he was in relation to the lift shaft that had brought him up, under escort, through the lower levels, and picturing where the other sets of shafts would, therefore, be situated. Then, walking more confidently, now that the initial ordeal of escaping from the Psychocentre was over, he set out briskly up the alleyway, steeling himself against the temptation to peer over his shoulder and to right and left and thus give himself away, perhaps, to some chance observer who would otherwise be quite unsuspicious of this tall young man in Cadet uniform who strode along this certain alleyway.

Cadet uniform! The realisation struck at his mind with savage force. They'd spot him as easily as winking an eye once they really got after him!

He quickened his stride, reached the end of the alleyway and crossed the wider road that lay at right angles to it, walking faster and faster. If he could get a change of clothing somewhere he'd stand more of a chance, but he didn't have enough exchange vouchers or credits to go into a shop and *buy* a new outfit. Besides which, he remembered, there weren't any

clothes shops on the Admin. Level.

If he was lucky the security men, once they discovered that he was missing, might go straight to the shaft up which he'd been brought, acting on the assumption that he'd be heading for his home or at any rate, for his home Level. But a change of clothes was, nevertheless, important.

Two monocars flashed by him as he crossed a street and one of the drivers shouted out at him, cursing him for jay-walking. And he, in turn, cursed himself for being careless, thinking of the scene that might have ensued if the man had stopped and called the nearest policeman to report a case of "pedestrian behaving in a fashion likely to cause danger to wheeled transport."

He walked quickly, keeping as much as possible to the smaller streets, heading for that section of the north wall of the Level where he knew he would find a block of lift shafts. If he could get out of the Administration Level and up to the Fourth he thought he might stand a good chance of reaching his destination without being caught, since the security men did not know where he was heading, and after presumably trying

his home Level first, would find themselves severely handicapped in their search for him. And if he could get hold of a change of clothes from somewhere he stood an even better chance of reaching the old man before his pursuers reached *him*.

The old man. The mental image of the strange Mr. Whittam was wavering and indistinct in Patrick's mind, no longer vivid and clearly defined as it had been in that cataclysmic instant of remembering when the entire weird sequence had burst upwards like a fountain, like a sudden, roaring geyser of memory thrusting through the bedrock strata of his unconscious.

Perhaps the old man had died or gone on holiday or moved to some other address! The possibilities sent waves of fear through him as he considered them. Before, while escaping from the Psycho-centre, he had thought simply of flight and of the old man's house as the refuge, the sanctuary to which he must flee. But now he could not help but think of the innumerable things that might go wrong, of the vast odds against him ever being able to *really escape*.

After all, reasoned the logi-

cal and pessimistic part of Patrick Vane's mind, even if he reached this man who called himself Whittam, even if he got there safely and without the security men pounding along behind—well, what could one old man do for him? What could anyone do for him?

He pushed mental fingers against these thoughts of defeat and the hopelessness of things and, finding that they were not immobile, pushed harder and dispersed them—or dispersed, perhaps, all but their shadows and their secret, lingering echoes. There was, he told himself, no sense in dwelling on the multitude of unpleasant things that *might* happen to him. And as for the old man—well, if he got there in safety and found the man at home, then at least he would be able to tell him about his problem and ask his advice. After all, he couldn't refuse to give it, surely, having been the one to offer it in the first place.

He was not so unaware of his surroundings as to miss noticing the Mole Corps officer walking towards him. He gave a brisk salute, which the man returned mechanically. Directly ahead of him, separated from him by one

building only; was the north wall of the Level and the vertical vermilion band that indicated the lift shafts for which he was heading.

This was going to be the test, he told himself. If the security men regarded his escape as a real emergency they would have notified the police and asked them to watch all the shafts, but there was the chance, of course, that they would not go to such extreme measures, since he had done nothing criminal, and had not even undergone the analysis that might have given them reason to consider him dangerous.

Dangerous! The word sounded ridiculous. How could he, Patrick Wellington Vane, of brooding, moody and unstable character, ever be considered dangerous to anyone apart, perhaps, from himself?

Yet hadn't his father said that they'd considered Harry Lake dangerous? And it had been that same Harry Lake, hadn't it, to whom, as with no other person with the exception of Margaret, he'd always felt so completely in tune?

A thought made him start. Supposing Margaret had already found herself in need of

"help or advice"? Supposing she'd needed them sufficiently to do exactly what he himself was doing—to make the journey to 1495, Fourth Level, and visit that strange old man called Whittam, who'd watched them and spoken to them in the canteen on that special afternoon so many, many afternoons ago?

The pavements were crowded, now, and he was forced to walk more slowly. Most of the people were coming towards him, from the direction of the shafts, and he knew that this was the influx of Administration workers returning from lunch hours spent on their home Levels. He threaded his way through them with caution, yet with determination, also, his eyes on the doors of the shafts themselves, whenever they were visible through the crowds, seeking for some signs of the watch that security men might so easily be keeping for him. Or was he being too pessimistic? They might have decided to send a man back to his home to check there before doing anything else. Or they might even . . .

His thoughts broke off as he caught sight of the black uniforms through a sudden gap in the crowd. Three of

them, standing together, talking, their conversation holding their attention from the doorways of the lifts, on which they had obviously been posted to keep watch.

Patrick about-turned with what was practically military precision, hoping desperately that they would not notice his grey cadet uniform, hoping that the crowd of returning workers would obscure him from their view.

The thought did not strike him until afterwards that they might have been stationed at the lift shafts for any number of various purposes other than that of keeping watch for him. Why, he thought suddenly, walking with the crowd, they might have just happened to meet there, the three of them, and be talking to each other just to pass a few minutes before going about their duties. But it wasn't worth risking going back and taking the chance of getting past them into one of the lifts. The best thing to do would be to hide until later on, somewhere, and then try one of the other banks of lifts on the chance of its being unguarded. But where could he hide, here on the Administration Level of all places? It would be difficult

enough *anywhere* in Deep London, but here it would surely be worst of all. How could anyone hide, Patrick thought with great bitterness, in a place where there were so many people with the power to stop you and ask you where you were going and what your business was, and with the power, too, to send you instantly to the Psychocentre if your answers weren't sufficiently good, there to be cross-examined and analysed on suspicion of being an Eastern Federation spy?

His mind shot back into memories once more in a frightened and uncontrollable flight from the minatory reality of the present.

Somewhere to hide. Like in the old days, with Harry, when they'd gone exploring in the freight transport tunnels in spite of what their mothers and fathers had told them, and in spite, too, of the notices which had told them, without any ambiguity in their wording, that the tunnels were dangerous and that they were out-of-bounds to everyone, even to freight transport workers, unless they had an official pass from the Transport Administration offices.

The notices had been huge and white, and frightening,

and they had had red lettering on them, but they had not been frightening enough to keep out those two boys, Patrick and Harry, who liked so very, very much to escape from their cricket-playing, football-kicking schoolmates and go off together, feeling very brave and very adventurous, to find the tiny cranny that the Public Safety workers had somehow missed while boarding up the disused tunnels, and thus worm their way into that hidden and very wonderful world of secrets and of darkness that, in the twin beams of light from their pocket torches, seemed so full of mysteries and vast excitements.

Oh, the games they had played in those tunnels! How fine it had been to lie in the darkness, your torch switched out, now, with tinglings of ecstatic fright running all over you the way you imagined water might run through the porous soil of the surface that was far above your head. You lay there all tight and clenched up, like a fist, trying very hard not to let your heart beat so loudly, listening to the other's approach. And if he passed you in the dark you would snap on your torch so that he would be caught in its

bright glare and you would make a noise with your mouth like a blaster discharging, and then the other—who might be an Eastern Federation spy, or a monstrous, five-armed, tunnel-boring Mutant or any number of other things, but who was really just Harry Lake—this other would have to fall down and play at dying and then that was one up to you. But if the other heard you first and switched on *his* torch and found you, then, of course, it was you yourself who had to die.

If only he were back there, in those tunnels, in the darkness, alone, instead of being here on the Administration Level with the Psychosecurity men watching the lifts for him and—as they almost certainly would be, by now—combing the streets for the young man in cadet uniform who'd escaped from the Psychocentre, and who was due for immediate analysis.

"Hey, just a minute young fellow." The voice was loud and clear and came from just behind him.

Perhaps he doesn't mean you at all. Don't turn round. Don't let him think you're expecting anyone to call out to you. Walk on casually. No, walk *quickly!*

"Hey there. It's *you* I'm talking to! (Excuse me, madam, this is official, thank you. Sorry, sir, but I must pass. Thank you.) Hey there!"

The inner voice that warned him not to look round was no longer strong enough in intensity to control his actions. He *had* to look!

The man in the black uniform, his white face set and scowling, was shouldering his way through the crowd. His fierce eyes met Patrick's and he pointed straight at him. "Yes, you in the cadet uniform. Come back here."

Run. Dash off. Hide. Escape. Now. Quickly. Down an alley. Anywhere. Into a building. Don't let him catch you. Oh God, for the tunnel. The dark tunnel. Alone in the tunnel. If only he were there, alone, in the dark. Run. Dash off. Hide . . .

The tunnel.

It was then that his foot twisted under him . . .

He lay in the huge womb darkness, and the memories fled out and away from him as if the mental bobbins from which the threads of recollections had unwound had given themselves one last

spin, had turned in one final revolution and then, their stocks exhausted, stilled their whirling movements with regretful sighs.

There must have been more, Patrick thought, frantic for further bobbins and for further memories. That can't be all. No. Never. Can't be.

But with a part of his mind he *knew*. With an oddly objective awareness and self-examination he knew that he had been lying there in the tunnel, forcing himself to think over everything that had happened to him, for a very specific reason. The same reason that had made him, when he had caught sight of the security men at the lift shaft, think back to the days of his childhood and re-live old memories. On *that* occasion his mind had refused to face up to the terrors that the present had held, and had sought a refuge in past memories. And it had just done so again. But what terrors had the present held on this last occasion? He was safe, wasn't he, here in the tunnel? Or comparatively safe, anyway. And he *had* been safe here when first he had sought sanctuary among his memories of the past. Then what . . ?

Run from it. Think of some-

thing. Go back to the past. Quickly!

This time it didn't work. Somehow there didn't seem to be any more memories, any more alleyways along which to flee, any more places to hide. This time he had to look the present in the eyes; the present—and the vast and terrifying question that it posed.

How had he got here?

He remembered the shouts of the security man, the blind panic, the brief hope that perhaps the shout might have been meant for someone else and not him at all. He remembered looking back, too, and seeing the man pointing and calling out to him. And there had been the bewilderment, the wondering which way to turn, the frantic and child-like longing for the safety and the darkness of the tunnel and then the abrupt, searing agony as his foot had twisted.

And then nothing. Nothing until the dream of the surface war and the awakening out of it and the almost immediate plunge back into memory that he had taken, unconsciously, as an escape route away from reality.

All right now. Get a grip on yourself. The objective Patrick Vane reasoned firmly with

that other Patrick Vane who was on the point of crying out and weeping and flailing his arms wildly about in the darkness.

You're here. In the tunnel. The tunnel where you wanted to be, remember? Right, then. Now either you've lost your memory for the entire period that started when you twisted your ankle and ended with that dream about the surface or else . . .

Well, or else you blacked-out with the pain in your ankle, collapsed, and then were brought here by someone for some special reason. Hey, wait a minute, though! A thought had struck the objective Patrick; a rather frightening thought. You don't suppose that you're just *thinking* that you're in one of the old tunnels because that was where you *wanted* to be? In the dark you can't tell. You might be in a blacked-out ward in the Psychocentre or—or practically *anywhere*!

He fumbled quickly in his pockets and found the multi-purpose torch that his father had given him one birthday a few years before. It could be a torch, cigarette-lighter or burning tool, according to which of the three little studs you pressed.

He pressed the correct stud, and at the same time struggled up into a sitting position. The bright, fan-shaped flame told him what he wanted to know.

Well, you're in the tunnel all right. No question about that. But how did you *get* here? Did you really lose your memory for however long it took you to escape from the security men and reach these tunnels? Doesn't seem possible. For one thing I can't see how you could have got away from that man at all, what with the fact that he was right on top of you, more or less, and you with a twisted ankle into the bargain. Besides (the objective Patrick stabbed out a mental finger, a fresh thought having struck him.) Besides, when you were thinking of coming to this tunnel you were half-crazed with panic and with the need to be alone and in the dark somewhere safe. You were *so* half-crazed, in fact, that you completely forgot that these tunnels are on the Luxury Level and that, if you were inside them you'd be even further away from Level Four and the old man than you were up in Administration! Even if you *did* lose your memory you surely wouldn't have been fool enough to

make a journey right down to your home Level where the security men would automatically think of looking for you more than anywhere else!

Patrick forced the duality into the nearest approach to unity that he could attain, knowing from past experience that that kind of mental argument could continue on and on if he let it. But this merging by conscious effort of the subjective with the objective produced, though he did not know it, no more than a still far from integrated Patrick Vane.

It certainly seemed improbable that he had managed to reach these tunnels of his own accord, and even more improbable, even if his memory *had* deserted him, that he would have consciously tried to reach them. But then it seemed just as absurd to think of anyone rescuing him from under the eyes of the psycho-security man and then taking the trouble to bring him to the tunnels. Of course these might be tunnels on some other Level that he hadn't known existed previously. But even so . . .

Somehow, not one of the explanations seemed to fit. As a consequence he tried to think of others.

Was it possible that he really wasn't in a tunnel at all, but under an Analyser, being forced to imagine himself in this situation as part of analysis, the security man having caught him and handed him in at the Psychocentre? Or was he even back at the chalet, back at home, in bed and dreaming all these fantastic incidents, all these nightmare captures and flights and escapes, and weird arrivals in dark places with no memory of how he had come to them?

The hard reality of the tunnel wall in the torchlight, and the throbbing agony in his ankle, both told him that, surely, he could not be dreaming.

Very well, then. If he wasn't dreaming then he was awake and, he recalled with no small fear, still a wanted man. The "why" and the "how" of his mysterious arrival in the tunnel could be answered, perhaps, at some later moment, but the important thing that he had to realise was that he was still a long way from 1495, Fourth Level, and that that was where he had to go if he was to stand any chance at all of evading capture. If he stayed in the tunnel he would probably die of hunger and thirst or—even more probable

—be driven out into the open because of those two needs, and run straight into the open arms of the security men. Therefore, he had to get out of the tunnel as soon as possible.

He got to his feet with difficulty, supporting himself with one hand against the tunnel wall so that his injured ankle did not have to take too heavy a strain. Then, with the torchlight to guide him, he started hobbling along.

There were only two directions in which he could go, and, since there was no patch of light or breath of wind to tell him which one might lead to the outside world sooner than the other, he started off in the direction in which he found himself facing when he got to his feet.

He did not have a watch and, therefore, could not tell how much time was passing during his long and painful journey through the silent tunnel glooms that were the very ones, perhaps, in which he and Harry Lake had played so many years before.

When he grew weary he told himself that it would be foolish to rest, and when his ankle pained him to excess he forced himself to continue,

fighting down fear of the thousand nightmare whisperings that called his name in the echoing dark and told him with tittering cruelty that the tunnel would never end, and that he was in a dream from which he would never awake and would—as naturally followed—continue to hobble and creep, and sweat and be frightened until the final day when the dream would end and he would fall down and, very quietly and just as naturally, under the circumstances, die.

Time was a thing that had meaning only when you were not alone. You knew how many minutes or seconds had passed when you were with someone else, because you had terms of reference, then. You could gauge time by watching your companion, knowing that it must have taken so many seconds for him to have said such-and-such a thing, or for him to have gone across the room and closed the window or pulled a chair towards the glowing wires of the fire. But in the deep tunnel gloom there are no companions and you cannot think of time at all in terms of anything except eternity. And eternity is ultimate and, therefore, mean-

ingless to something that is not itself ultimate.

The pain in his ankle no longer troubled him, because it had grown and become a part of himself, and of the place in which he was. The pain. The torch. The walls. The movement.

He saw it after perhaps twenty minutes from the time he got to his feet, or perhaps after ten thousand years from that same instant.

It was very near when he saw it, for his torch was not sufficiently powerful to illuminate very much of the tunnel.

He moved nearer to it. He reached out a trembling hand and touched it, and knew instantly what it was. The Public Safety men had been very thorough with this particular tunnel. It would have taken a Mole Heavy to break a way through the stone and cement and girders that had been used to wall off this disused, and probably dangerous, freight transport tunnel.

The whisperings and the titterings and the sly, secret gargoyle voices crowded in about him. The end of the dream has arrived, they said. The eternity of movement was over, they informed him.

Now, of course, he would get his reward—the long, long sleep which he desired so very much. And what was that? Why, death. *Naturally.*

He was on his knees, beating his fists against the wall that separated him from the light and the life that existed in the world from which it now seemed that he was cut off forever and forever.

On the ground beside him, lying where he had dropped it, the multi-purpose torch flared its orange flame up to illuminate his weepings and his sobbing entreaties, and the flailing of his arms.

And the whispering nightmare voices fled away, aghast at this spectacle, despite themselves.

Then there was only the voice of this young and terrified man, alone in the blocked tunnel, his cries echoing and re-echoing through the long darkness, back and back.

"I don't want to die! Oh, please I don't want this to be the end! No, no, not even if I sleep. Not even if there isn't any more pain or crawling along. Don't let me die. Help me! *Help me!* Old man. Whittam. You said I could come to you. You told me. 1495, Fourth Level. You told me that. Your address. Old

man. Whittam. Help. 1495. Fourth Level. Must get there. Escape . . ."

The echoes continued after the voice itself, the screaming, crying voice, had ceased altogether. The echoes bloomed like ghost-sound flowers; they bloomed and bounced from wall to wall in their eerie passing down the long length of the tunnel. And then they were gone.

On the ground Patrick Vane's torch continued to burn and flicker, and thus cast a little light in a place that was otherwise very dark and very silent. And which was also—empty.

"Take it easy, now."

"Huh? What? Where?"

"Just relax yourself."

The bed was soft and comfortable, and the sheets were crisp and white, like the tiles in the chalet kitchen that his mother was always polishing. He stopped the train of thought abruptly. Not any more. No more being afraid. He raised his eyes to those of the old man who stood by his bed.

"How are you feeling?" Mr. George Whittam asked him, smiling down, looking very much the same as he had done on that previous oc-

casion in the canteen, except that this time he wasn't dressed in tattered work clothes.

"All right," Patrick said, keeping his voice low and controlled so that he wouldn't shriek out, one after another, the million questions that fought for prominence on his tongue. "How—how long have I been here?" he asked, at last.

"Something like eleven hours, most of which time you've been sound asleep."

"You found me and brought me here?"

The old man shook his head. "No," he said, "you came on your own."

He remembered the tunnel, the painful crawling along, the wall. "But—but how?"

"You mean you still don't know?"

He hadn't dared to think about it that other time, when he'd found himself in the tunnel because—well, because he'd never had it happen to him before. But he'd done something *like* it before; he'd made the toy robotplane move about, and he'd helped Margaret to move the spoon. And if he could do things like that why wouldn't it be possible for him to . . . ?

"Did I—did I sort of *think* myself here?"

Whittam nodded. "That's more or less exactly what you did," he agreed, still with the smile on his face.

"And you *knew* I could do it? You knew, that first time, in the canteen, that I'd come here like this?"

"No," the old man told him. "I couldn't know what *would* happen, but only what *might*. From every point of every line on the Fan there start up other Fans, each with an infinite number of lines, and because of this none of us can see the certainties, but only the possibilities and sometimes the probabilities."

"Fan?" said Patrick, blankly. "What Fan?"

The old man sighed, fetched an upright chair from the far wall of the little room and brought it over to the bed. He straddled it, then, resting his arms on its back, keeping his eyes on Patrick's face. "You want the story," he said. It was not a question, but a statement.

"Yes, yes. How did I——"

The old man cut off his question with a movement of his hand. "This story," he said, "doesn't start with you at all. It's a story that goes back quite a way, and if you

want to understand it you'll have to let me tell it from the beginning. All right?" He saw from Patrick's face that it was all right. So he started the story.

"Before you were born, before your father was born and before the Deep Cities had even been thought of, before the war started, in fact, people were able to spend their time thinking about things other than how to kill their enemies and how to keep themselves alive. Not many of them, perhaps, could get themselves excited about anything but making money, but some of them could. And one of the things that interested these odd people who were searching for knowledge was the fact that right through history there'd been accounts of strange happenings that their scientists couldn't explain. Forces that could throw things about, break windows and so on, for instance. Or people who could tell what was happening to someone miles and miles away, just by thinking about them. Even tales of people who could be standing right next to you one moment and the next moment—" He made a motion with his hand—"gone. Just like that. Then they'd

turn up somewhere else and not know what had happened to 'em.

"Well, they started investigating these things some time in the early part of the last century—*really* investigating them, I mean. They built special colleges where such matters could be studied and where people who thought they had some kind of weird talent could go to be tested. And all that went on right up to the war. And then, of course, it had to pretty well stop. Yes, the war roughed things up for the investigators; and just when they were really getting to know something about the things they'd been tackling and worrying over for all that time. But war was war and that was that."

"But what *did* they find out?" Patrick blurted, unable, this time, to contain himself.

"We'll come to that after," Whittam told him, firmly. "Just now I want to explain the pattern of events that led us up to where we are now." He looked up at the ceiling, remembering where he had got to in his story, then he went on: "Once the war started, as you'll know from your history books, everyone started digging out places to hide in when the bigger bombs came.

From then onwards there were just two thoughts in people's minds: 'Build bigger and better bombs than the enemy can build,' and, 'Dig deep enough and make the hole strong enough just in case the enemy builds a bigger bomb first.' It took a long time to dig out the Deep Cities, but it took a long time, too, for anyone to risk using their atom and hydrogen bombs. Most of the Deep Cities were already built, and had people living in them, when the first atom bombs were dropped, though they've been enlarged a hell of a lot since then, of course." He squinted across at Patrick. "I suppose you think I'm making a long-winded thing of all this," he said, smiling. "But I'm just giving you the background so that you can see why things developed in the way they did. You see, once the radiation and the germ sprays and all the rest made the surface too hot to let people carry on living on it, the whole war and the whole fight-till-you-kill-him-or-till-he-kills-you attitude came down here to the Deep Cities, and that sort of attitude is crazy when you can't see your enemy."

Patrick frowned. "It's crazy

whether you can see your enemy or whether you can't," he said.

"Ah, yes," Whittam agreed. "But I'm not talking idealism; I'm talking practical common sense—the sort of common sense that should have told people a long time ago that a war fought underground could last infinitely longer than one fought on the surface. Our Mole Heavies go out to try and find the enemy's Mole Heavies or, better still, an enemy outpost somewhere. Right?"

"Uh-huh."

"And the enemy have exactly the same idea. But how many decisive victories are ever scored by either side? How many have *ever* been scored? Very few. One Mole meets another Mole and there's a battle and one of the Moles is usually destroyed and its crew killed, but even that doesn't happen all that often."

"But how does all this tie in with—"

"It ties in like this: because underground warfare can go on and on indefinitely, because of its actual nature, we down here in the Deep Cities have had to adapt to total war. At first it was just that—we had to adapt. Later it grew into something a little different;

instead of just having to adapt ourselves we found that there were people whose job it was to see that we adapted and to make things hard for us if we didn't. Psychology, from being simply a science of the mind, became a conditioning force, became a major power, in fact. And since the emergency of war continued, psychology had to do the same, its power growing all the time, forcing into us and our whole society the acceptance of war as the prime governing factor in our lives."

Patrick remembered his father's words on the same subject and interrupted the old man to tell him what the General had said.

Whittam nodded. "Exactly," he grunted. "Your father hit all the nails right on their various heads. We've become the slaves of electronic machines and psychologists, and ever since man came to live underground those two powers have been getting stronger and stronger, with the result that nowadays most people grow up in complete acceptance of the type of life they have to live, and of the war itself, even. Those that can't accept the *status quo* are, through psychosurgery, altered so that they *do* accept it."

"What about the ones that can't be altered?" Patrick asked, his voice husky now that he had come to matters that affected his own life.

The old man stared at him fixedly. "Those that can't be altered are potential menaces in a society geared for total war and for nothing else. They are potential riot-leaders, possible starters of civil wars, probable lowerers of public morale. And, therefore, they cannot be allowed to mix with other people; nor can the Deep Cities afford to keep them in institutions or the like because a large percentage of these malcontents have certain strange abilities that, if consciously controlled and directed, would make their possessors just as dangerous inside the walls of an institution as outside them. No, Patrick, the ones that can't be changed by psychosurgery are killed."

He didn't question the old man's words. Somehow he was aware that this man, to whose house he had so mysteriously travelled, was speaking of things that he knew to be true and was not simply repeating rumours or constructing the tale from an over-powerful imagination. "These ones that can't be

changed," he said, slowly. "They're—they're mutants?"

Whittam smiled and shifted on his chair. "That depends what you mean by 'mutants,'" he replied. "There are mutants and there are mutants. A child born of parents affected by hard radiations can arrive in the world with extra limbs or it can arrive looking just like any other baby."

"I mean someone with powers that ordinary people haven't got. Mental powers."

"Then in a way you'd be right in calling them mutants," the old man admitted, nodding his head. "You'd be right because you, like most people, think of *ordinary* men and women as being folk *without* these powers, while those that have got them are *extraordinary*."

"Well, of course I think that way," Patrick said, more than a little bewildered. "What are you getting at?"

"I'm getting at the fact that, for century upon century, it's been an accepted fact that normal people don't have the powers and abnormal people *do* have them. Why has this been so? The answer is obvious—if a small minority possess and use particular powers and a large majority are unable to use such powers

it stands to reason that the minority are freaks and the majority are normal. That idea has held good for a very long time, Patrick; it's really the most sensible explanation, and the most logical one. But"

—Whittam held up a cautionary finger—"but supposing, now, that I tell you that it's the *wrong* explanation. Supposing, now, that I tell you that, in point of fact, the reverse is true—that the minority are normal and the majority are subnormal. How would you explain the fact that the number of normals is so small and the number of subnormals so large?"

Patrick frowned, trying to follow the old man's argument, and at the same time attempting to relate the discussion with his own personal problems. "I—I couldn't explain it," he admitted after a moment's thought. "Unless . . ."

"Yes?"

The thought had whirred through the channels of his mind with crazy speed and had left but the echo of itself for Patrick to grasp and examine, and consider and almost—but not quite—discard. "Unless the subnormals were . . ." he started.

"Go on." The old man watched him closely, eagerly.

"... were really normal, but didn't know it," Patrick finished, the idea seeming to him now to be less insane than when it first had come to him.

Mr. Whittam relaxed the stern and eager tension of his face. His body, too, seemed somehow to flow from rigidity to soft comfort and ease. "You've got it, boy," he said, quietly. "Just try and imagine a society where everyone communicated with each other just by using their minds. Then imagine the odd, *different* person who started to draw pictures, say, with a bit of charcoal, and showed them to one of his companions. Think what would be said of a person like that, in a society like that where drawing was completely unknown. He'd be a freak, wouldn't he? And anyone that did the same would be a freak, too. The fact that *everyone* in that society who had the use of their eyes and their fingers could do exactly the same sort of thing as the freak had done wouldn't make a scrap of difference. The majority would still—in their own eyes, anyway—be the normal people, while the minority would be the different ones,

the freaks, or, if you like, the mutants."

The idea that had been so vast, so insane, so illogical, was made almost acceptable to Patrick by the old man's theoretical parallel. Almost—but not entirely. "But in that sort of society you'd expect people to discard drawing; they'd got complete mental communication, hadn't they? What would they want with drawings and stuff like that when they could get their ideas across much quicker and much more successfully just by thinking? They wouldn't *need* to be able to draw. But with humans it's not like that. Plenty of people would be only too pleased to be able to use these—well, these *normal* powers if they'd got 'em. Who'd want to mess around with visors and stuff like that if they could get in touch with whoever they wanted just by using their minds?"

"Ah," said Mr. Whittam, leaning forward over the back of the chair. "Ah, but then supposing they didn't know how to get in touch just by using their minds? Supposing, too, that they'd been brought up to think that stories about people who *could* do such things were all nonsense?

With that idea firmly stuck in their minds at an early age they'd grow up thinking that such things simply couldn't be done at all, by anybody, and certainly not by they themselves." He waved his hand as though by making such a motion he could explain the entire idea. "It's the conditioning process all over again. If you're brought up to believe a certain thing is true, then there's a ten to one chance you'll *continue* believing it to be true, and sometimes you'll continue believing even against the evidence of your own senses. And that's just what man's done. He's convinced himself that most stories of strange mental powers are false and that the few that aren't false point clearly to a person who is freakish and very different to the normal type of man or woman. The idea that *everyone* possessed such powers never occurred to him because *everyone* didn't use them. The idea that everyone didn't use them because everyone didn't know *how* to use them, naturally didn't occur to him either."

Patrick lay back in the bed, resting his head on the pillow, thinking. Then he said: "If everyone's got these powers then why can some of 'em use

them and others not?" Before the old man could answer, awareness having come to him of his own strange powers and the erratic way in which they had manifested themselves, he followed his first question with another: "And why can't the ones who've got the powers use them whenever they want?" He sat up in the bed and glared at his companion, the anger coursing through him with sudden violence—anger at the fact that he still did not understand what was happening to him, but more especially anger at the old man's apparent awareness and deeper knowledge of the situation.

"Don't get annoyed now," Mr. Whittam cautioned. "That won't get you anywhere. I've taken a long time telling you very little, I know, but then these things can't be rushed. Those two last questions of yours, now, are things I'm not too sure about myself. There are still quite a few things about these abilities that we haven't tracked down yet, and since I'm way down in the grade scale I know less than most."

Patrick was about to reply when he realised just what the man had said. His eyes

widened. "Less than most what?" he demanded.

"Less than most of the others, of course."

"You mean others with powers like mine? Is there some sort of organisation, then?" It seemed too far-fetched to be possible; a group of people with abnormal powers—he still had to think of them as being abnormal—existing undetected in Deep London! It was fantastic. And yet . . .

Whittam nodded. "There's a group," he said, a certainty in his tone, a knowledge with which one could never argue. "It's very loosely-knit because it's got to be that way, things being what they are down here. And it's not just in Deep London, either."

"You mean there are other groups in other Deep Cities?"

"Not quite that. Let's say that the group has members in *all* the Deep Cities." He smiled, seeing the question in Patrick's eyes. "Yes, the Eastern Federation Deep Cities, too. Sounds crazy, doesn't it? But it's not, once you start thinking about it. The group formed out of people who had control of their powers, you see; it began as a number of telepaths—that's men and women who can communicate

by thought alone—and since then it's grown up, as you might say, and includes anyone who possesses control over their powers and also those who can be helped to gain that control. But everything has got to be done secretly. We can't advertise or we'd have the security men on us right away, and we can't afford to take risks like that—for the good of the whole group. Consequently, we often miss people, or can't get to people, who may possess these powers in abundance, but who don't know what they are, or how to use them." He shrugged. "You can see how difficult it is for us."

"But that time in the canteen," Patrick started, frowning in an effort to concentrate on the whole problem, yet at the same time find answers to his own personal questions. "When you saw that business with the spoon, you knew then that we were—well, that we'd got the powers, and also that we could use them. Yet all you did was give us your name and address *in case we needed help*. If your group is so keen to spot people like us, why didn't you tell us, there and then, about who you were and where we could go to

find out more about ourselves?"

"I thought you'd ask that," the old man said, nodding in approval. "It's a good question."

"Well, then, what's the answer to it?" Patrick demanded, impatiently.

"The answer is that your case is something special. Something possibly *very* special. You see, Patrick, some people have quite a number of these special talents, while others have just one, or maybe two. I've just got one; I'm a telepath and that's all, at present. Perhaps if there wasn't a war, and if everyone started accepting the powers as being natural, and if they gave up a lot of their time to investigating them and giving training to those who had them—perhaps under circumstances like that I might find that I'd got more ability than I thought. Anyway, one of these abilities is the power to see into the future. It's called clairvoyance. Not many people have it in the group, but from the results obtained from those that *can* see ahead we've been able to get a better idea of things like 'past' and 'present' and 'future' and 'time.' From these results we've been able to visualise

the future spreading away from us in the shape of a Fan, and on that Fan there is an infinite number of paths that we can take at any given moment in our lives. Follow me?"

"I—I think so."

"Right. Now the ability to see ahead can *never* be a guarantee of what *will* happen, but only of what *may* happen, because the Fan is already there and the clairvoyant can never see the entire Fan but only one of the infinite number of paths, and he can never be certain whether that path that he sees is one near the outer edges of the Fan—which would be one of the least probable courses for the future to take, or whether it's near the middle of the Fan, which would signify a higher degree of probability. Also, we've found that any action taken in the present to prevent an event occurring in the future, somehow shifts the position of the Fan—or of the constituent paths on the Fan, rather—so that probabilities become improbabilities and so on. And that's the reason that you had to come here in the way you *did* come here, and why I couldn't do any more for you when I first saw you. One of our

clairvoyants had seen a probability path that included you and in which you played a very prominent role—because of what you are. But he also saw the way you arrived here, so from that we knew that if we got you here ourselves, in any other way, then we might easily affect the probability variation of the path on the Fan."

Most of it was too new, too strange, to sink in immediately. It was as though all the old man's words and the incredible possibilities that they signified were hanging in some strange, dark nimbus about Patrick's mind, sending down tentative threads of themselves, only to brush against certain sensitive spots upon the shell of his consciousness. *Because of what you are*, the old man had said. But what *was* he? He asked this question.

Whittam eased himself up from the chair and then moved it back to its original place against the wall. "I'm not well up enough in the technical side of all this to be able to rightly say, Patrick," he replied. "But you're something pretty important. Or could be, if you knew exactly how to use all your powers. If you feel strong enough I

could get someone else to have a talk to you—someone who's up on all the jargon and who can do more than anyone else to help you use your powers the right way."

"I'm strong enough," said Patrick, swinging his legs over the edge of the bed.

The old man handed him his clothes from the back of a nearby chair. "Get dressed, then," he said.

Patrick struggled with his shirt. "Who is this man that knows what's what?"

"A doctor at the Psycho-centre."

"What!"

Whittam chuckled. "I know how it sounds. But the Psycho-centre is about the only place for this particular man, since he's a psychologist."

"But if I go back there the security men will——"

"Will know nothing about it," the old man finished for him. "Oh, I know what you went through all right. I know all about your escape."

"I was delirious?"

Whittam shook his head. "No, you're just forgetting that I'm a telepath and can get most of your surface thoughts straight out of your mind. But there's no need to worry about going back to the Psycho-centre. The security

men won't see you because one minute you'll be here, and the next you'll be right there in the Psychocentre, in a private examination room with the doctor."

"Just by thinking it?" Patrick asked, getting into his trousers, remembering the way he had arrived from the freight tunnel.

"No, not quite. If you could manage it again all well and good, but I doubt very much whether you could because, consciously, *you* doubt whether you could. No, the way we'll do it is like this—I'll 'path through to the doctor and tell him you're here. Then *he'll* 'path through to the nearest available member of the group who can move objects about, transmitting a visual image of you that I'll have given him. Then this other man will use his power to move you from here to the Psychocentre and to move the doctor, also, from his home. Now don't talk any more for a while; I've got to get through."

Patrick finished dressing in silence, watching the old man, who stood leaning against the wall of the room, eyes closed, concentrating his thoughts and sending them outwards and outwards into the arti-

ficial night from this small chalet on the Fourth Level of Deep London. And still the question thundered in his mind: *What was he?*

Whittam opened his eyes.
"Ready?"

He nodded.

"Let your mind go, if you can; it'll be easier for him. Just let yourself think of getting to the Psychocentre. Nothing else. Get rid of all that stuff about what you are and how you fit and the rest. Just think of getting to the Centre."

He stood in the little room, obeying the old man's instructions, freeing his mind of all thought but that of reaching that same building from which, not many hours before, he had fled in such terror.

"Ah," said Mr. Whittam, after a moment or so, letting out his breath in a deep and satisfied sigh, now that he found himself so suddenly and so completely—alone.

There was no unconsciousness this time. Nor was there fear, but only a growing acceptance of the vast and incredible pattern of new ideas that Whittam had described to him moments before. And with the growth of acceptance came the corres-

ponding lessening of amazement and surprise.

The man who faced him across the desk was small and pale, and strangely bird-like. He smiled at Patrick. "Getting used to telekinetic movement?" he enquired.

Patrick allowed the tension to flow out from his limbs and then, automatically, glanced towards the door on the far side of the room.

"It's all right," the man assured him. "No one can hear us. No one knows we're here, either, since I used the same means of getting here as you did, and if things go well we shall both have left before the earliest arrivals get here to start their day's work." He held out his hand across the desk, saying: "My name's Allard, Patrick. I expect Whittam told you that I could explain things more fully than he could."

Patrick took the proffered hand and shook it. "That's about what he said," he admitted. "Told me you were up on the jargon."

"It's my job to be up on it," the doctor agreed. "I'm a psychologist. Mind if I 'path you a bit to see just what Whittam said and how much you still don't know?"

Patrick gave a laugh. "Go

ahead, sir, but you'll find it pretty muddled in there."

Minutes later the doctor looked up and nodded. "Muddled, yes, but not muddy," he said. "You've got quite a bit of it sorted out, but the fact that your chief question is still unanswered is preventing you dealing with the rest. You want to know why you're so important to us. Right?"

"Uh-huh. I know I've got some of these powers and can't use them yet, but then so must lots of others. What's so special about me?"

"Let's look at these powers a moment," said Dr. Allard. He held up his hand and tapped on his fingers as he named the varied abilities and explained them. "There's telepathy—the power to communicate by direct thought. There's telekinesis and teleportation, which are closely related and which mean, respectively, the power to move objects by the power of thought, and the power to move oneself by the same process. Then there's clairvoyance—the ability to see ahead along the various probability and improbability paths of the Fan. Some of those groups can be broken down into sub divisions, but

we needn't consider them right now. After all that comes a group of abilities that are really speeded-up versions of normally accepted abilities; things like lightning calculation, photographic memory and so on. Now we've already come across cases of all these abilities. Some people, as Whittam told you, have perhaps one or two together, while others may have more. But we've never come across a complete set of what we call the psi faculties existing all together under the same roof, so to speak. Never, that is, until you cropped up. That's one reason why you're important. The other is the more important one."

Patrick nodded slowly. "Go on," he prompted, wondering vaguely what reason *could* be more important to these people than the one he had just been hearing about.

"Well, I don't suppose the word telergy means anything to you, but it's used to signify the action of one person's mind on that of another. It's a very elusive thing indeed and, thanks to the war and all that's followed as a result of the war, we're still a long way from finding out much about it. But you, Patrick Vane, apparently pos-

sess telergetic power to a fantastic degree, though you can't control it consciously. *That* is why you're so important."

"You mean because I'm the first person you've come across who's got this—this telergetic ability?"

"Not just that. As Whittam said, one of our clairvoyants saw a probability path on the Fan in which you figured prominently. You figured prominently because, on that path, you had complete conscious control over what we can call the normal psi faculties, and also complete control of your telergetic power. And that last power, apparently, is something so vast as to be almost beyond the understanding and comprehension even of people of our group who know something about such things."

Patrick felt a chillness exploring his body and his mind alike. He licked his lips. "On this—this probability path, now," he said, "how was I using all this power?"

The answer was spoken simply and quietly. "To end the war."

To end the war! To break the society in which he'd been brought up; break it and force it to see the idiocy of its own

self-destruction. To have the power to prove to them all that his own idealism could be a reality! The idea was too big. Too big.

"Think," said Dr. Allard, his bright eyes brighter still with his excitement. "We're all loosely organised; we have to be, in order to escape detection. But your power, consciously applied, could end all that. You could contact, and influence, the mass mind of humanity. Even with our telepaths all working full out we could never hope to accomplish a fraction of what you could do."

He veered sharply away from the vastness of the idea once again, posing yet another question: "But how can I get conscious control of these powers? If you've read into my mind then you'll know just what things I've been able to do in the past, but you'll also know that I've never been able to control them properly."

The doctor nodded. "I know that," he agreed. "You, like everyone else, have been brought up to disbelieve in your powers and as a consequence you can't use them. By a form of psychosurgery I can remedy that, here, in the Psychocentre, now. I can send you back, mentally, to

the moment you were born, working in the same way that the official analysts work, only with a different intention. Instead of altering your past memories so that you come out of it thinking the way society wants you to think, you'll come out with memory patterns firmly planted in your unconscious and your conscious that will tell you that your powers are perfectly normal and that you can use them any time you want. After that, since you'll be consciously clairvoyant, you can see yourself on that future probability path, and that'll explain things better than anything else could ever do."

"Psychosurgery," breathed Patrick, half to himself and half to the doctor, thinking back and remembering how very, very hard he had tried to escape such a thing. But this time, he told himself firmly, things would be different. This time there was nobody anxious to make him think of himself as being no different to anyone else; but someone, instead, who would make him see exactly *why* and *how* he was different, and who would also show him that such differences were not terrible things from which to

run and hide in fear, but that they were great powers which were his to use in causes that were dear to him. He nodded to Dr. Allard. "Can we get through it all before the morning workers get here?" he asked.

The doctor stood up behind his desk and pointed towards a metal door. "There's a Processing room through there," he said, "complete with Analyser and everything I need. And there's plenty of time."

They walked towards the door.

The mechanical Analyser took slightly over three hours to reveal to Dr. Allard the past life of his very particular patient, questioning and probing in the depths of unconsciousness and preconsciousness to which even the powers of a telepath such as Allard himself could not penetrate.

Patrick Vane, drugged and flaccid in the great metal chair, knew nothing of these revelations that his mind was making to the intricate electronic questioner. He was unaware of word-association tests, unaware of pneumographic apparatus that recorded changes in his breathing, unaware of the fact that

even the smallest psycho-galvanic reflexes in his skin were being recorded and integrated with all the other information that he was unwittingly supplying.

The psychosurgery itself took a further two and a half hours. It would have taken far longer had not Dr. Allard been a telepath, and had not Patrick Vane been a special patient on whom he could use his telepathic powers without fear of discovery.

Once again, as when under the Analyser, the Processing room was the whole world for Patrick Vane. It was the bed in which he had been born and the cot to which he had been transferred. It contained everything that his life had ever contained—up to a point. For the life he lived over again was a life slightly changed here, very changed there, altered in a certain fashion elsewhere. From the vast amount of information supplied by the Analyser, Dr. Allard was enabled to see where to strike, where to correct, where to change. From the savage selfishness of the new-born infant mind right up to the puzzled and eighteen-year-old Patrick's last conscious thoughts the doctor was with him, watching

for the right moments for his corrective therapy to be applied to the best advantage, knowing where to halt the accelerated re-life in order to twist an event or an emotion in a certain manner by telepathically transmitted visual images, or perhaps by reducing the complexity of the event to the stage where a single sentence or so, spoken boomerangingly through to the unconscious and remembering mind of his patient, could effect the necessary alteration.

Thus, in this speeding, fleeting second life of Patrick Vane, the boy *knew* that he would make the toy robotplane fly; he *knew* that he was able to make a certain cricketer score a century; he was very well aware that he could make young Harry Lake think of the same thing as that which he himself was thinking.

But the process involved more than simply the alteration of conscious thoughts relating to particular events; it involved the firm imbedding of the new thoughts in the unconscious stratas of the mind, and also the complete removal of all thought of past failures in attempts to use the various psi faculties of which—in this new life—Patrick Vane was far from being frightened. It

was, in fact, the un-doing of eighteen years of environmental conditioning . . .

At last, the fresh memory-pattern installed, Dr. Allard spoke the words that were, in effect, an epilogue to an old life and at the same time a prologue to a life just beginning. His voice was magnified by the amplifiers to soft thunder as it probed deep and deep to vibrate along every channel of the young patient's mind.

"Do you hear me?"

"I hear you," said Patrick Vane's mind, speaking from within the deep gloom stupor of pre-conscious worlds in which he lay, like a drifting mote of being, swimming in the green immensities of an infinite sea whose surface surged restlessly miles and miles above.

"I hear you." He could not stop himself from answering that questioning voice, despite the troubling irritation of its delving down to him through the beautiful green world in which it would be so fine to lie for ever, drifting with aimless and caressing currents. "I hear you."

"Do you wish to know what is ahead of you? Do you wish to see the Path on the Fan that can be *your* path? It is

there, ahead of you, if you wish to see it. The number of Paths on the Fan is infinite, but you can make this certain Path the reality, later, if you wish."

How pleasant it would be just to lie in the green liquefaction, though. But no, that was wrong. He *did* want to see this Path that the voice informed him could be made the reality, He *did* want to see it.

"Show me the Path."

"Move onwards and you will see the Path. Move onwards."

The green tides and the whispering eddies caught him and drew him, and the green water universe became like a mighty Fan spread out just a little way ahead of him. And in the middle of the Fan there was a Path. *The Path.*

He moved onwards and then the Path was beneath his feet and the green world was nothing but a hazy dream-cloud in his mind. Instead, he was in the Processing room of the Psychocentre, standing very still, conscious of nothing save the enormity of the powers that he now knew to be his.

It was as though he were at the centre of a giant web of force that spread outwards

from him, extending on and on in every direction. And it was a web not only of force, he discovered, but also of awareness. For here, at this point on this certain strand of the web, was Margaret, still very much alive and now a member of the group which had conscious control of its psi faculties. And there, at this other point, was his mother, while somewhere else stood the old man who was called Whittam and who had, in a very strange way, been his benefactor.

But the awareness extended further than this. It was an awareness not only of people and places that he knew or remembered, but of events that were transpiring in innumerable places, both in the Deep Cities and on the surface far above.

He saw the great churning bulks of the Mole Heavies as they squirmed and thundered their way through the solid rock in their efforts to reach enemy Moles or, better still, enemy outposts. He saw the Deep Cities of the Eastern Federation and witnessed the manner in which similar conditions had produced similar forms of society to that in Deep London itself.

And, the strands of this

web of awareness reached upwards to the skies that he had never seen—the skies in which the robotplanes still soared with their fiery screamings and in which the great rolling clouds of war dust still billowed over ruins that once, long ago, had been Man's strongholds.

The creeping approach of conscious determination vibrated along the strands of awareness. He turned slightly and saw that he was not alone in the Processing room. The little psychologist, Dr. Allard, stood beside him, looking up at him with great excitement in his eyes and something else, too, mirrored there. Was it—could it be *awe*?

Conscious determination.

It grew up within him slowly, advancing upwards with caution, yet with strength also. It grew out of a lifetime of living in a society conditioned to accept war as a natural phenomenon, and it came, too, from a million memories that reminded him insistently of how continually tortured he had been because of his—difference. And now he knew what his differences were; knew that he was different not because he was ab-normal, but because the others were sub-normal. They—the others

—had chosen to follow paths that led them directly away from full realisation, away from ability to control and use the psi faculties that lay in embryo within them, and which could have given the race its true manhood—or its true godhead.

The determination shivered away the fragments of its uncertainty and became—purpose.

The strands of awareness quivered and told him of the shape of the world in much the same fashion as a spider, sitting at the centre of its web, might tell when a passing fly should chance to get itself entangled. He saw the multitude of things that his conscience had always told him must be wrong; he saw the injustices and the brutalities, and the vast blanket of intolerance that seemed to him the greatest of all these evils. For it was intolerance of others that begat wars and quarrels, and international strife. And that same intolerance stemmed from the fact that Man had taken a path that led away from his full realisation, for with universal conscious control of the psi abilities such intolerance could never exist.

And was it possible that

he himself, through the vast powers that were his, could force Man back on the path that he had abandoned so long before?

There was little doubt in his mind that he could. But the war was first to be dealt with. Yes. Certainly. The war first.

He looked at Dr. Allard. "Now?" he asked.

There was no need, he knew, to use words, but the habit was still with him. He could read the doctor's thoughts and receive from them the affirmative answer before the little man could even nod his head. And he could read there the amazement and the awe, also, seeing how the doctor had expected the realisation of his full power to take longer to dawn on him, had expected a time lag during which they might, together, consider how best his powers might be used to stop the war.

But such things were unnecessary. He already knew the full extent of his ability, and by this reason alone, knew exactly how best to utilise it.

There was so much to be done. So very, very much. But the goal ahead of him was a wonderful goal, and such as would justify any means being

used to attain it. And above all else, for him, there would be Margaret . . .

Then the purpose flowed and became transfigured into action.

The great force spun away from him, outwards and outwards along the filigree strands of the web at the centre of which he stood. And this force was not a blind force, nor was it a thing of destruction. It was not a beam that would halt men in their tracks, immobilising them, making statues of them, and thus preventing them continuing with the various duties entailed by the war in which they were engaged. And certainly it was not a death force that would erase all fighting men with one swift, killing puff.

It was none of these things, though it might have taken similar forms had its controller so willed.

But Patrick Vane, being the person that he was, did not so will. The futility of such measures was quite plain to him, for neither statues nor dead men could be used to build a new world, and a new way of life out of the old. They could never aid in the great task of setting Man back again on the road to self-realisation, back on the road

he had abandoned by concentrating on the things he could do with his hands rather than those that he *might* do with his mind alone. No, for those tasks live and active men were needed.

The force wave pulsed out and threaded its infinity of fingers through the miasma of the collective conscious and unconscious of humanity to find that most secret and deeply hidden part of it—the group conscience: that small voice that whispered on, almost unheard, pointing out the basic wrongness of one certain thing and the basic rightness of another.

Once, perhaps, such a conscience might have been a strong thing possessing strength and power in its tones, but now it was very far from being strong, and its tones were like the last echoes, barely audible, of things spoken ages before. For what was right and what was wrong had been supplanted, over the long years of propaganda and conditioning, by what was necessary and best for individual constituents of the group, but not for the group as a whole. And with this dis-unity had come the great trembling apart, the great

weakening and the great, slow dying.

The power of Patrick Vane acted as a titan amplifier. It took this small whisper that was so near, it seemed, to extinction, and it blossomed it upwards with Jack-and-the-beanstalk speed, making it rise from a whisper to a mutter, from a mutter to a chant, from a chant to a song, from a song to a thunderous roar that permeated collective consciousness and unconsciousness alike with its great injunction: "*The war will stop — Now!*"

There was no fear in any man's mind, then, that an alien force had stopped the war. Nor was there fear that it was some trick of the enemy's, for one knew, somehow, that one's opponents were also aware that the war had—in that instant—stopped.

In Deep City factories, everywhere, switches were pulled and buttons pressed, and production belts stopped. And these things were done automatically by whoever happened to be there at the time, without waiting for the authoritative word of the overseer.

The war did not come to a halt or slow down. One moment there was a state of

war, and the next moment there was no state of war. In a thousand rock tunnels a thousand Mole Heavies stopped their groaning progress and their crews looked at one another, smiling. In steel and concrete cells, in innumerable Deep Cities, guards and warders opened doors and shook hands with smiling men who were now ex-prisoners of war. It took but a little while, after that, for officials to declare the day a public holiday.

The war that raged mindlessly about Earth's surface and in the skies of Earth was stilled, too. Patrick Vane's telergetic power boosted that of every telekineticist throughout the world-wide psi group; boosted it and gave it direction and purpose. And in this way the crazy robotplanes and seekerbombs were swept off their courses, like feathers caught in a hot summer wind, to be lowered down gently and carefully to rest, their automat controls no longer functioning, their death songs all now sung . . .

In the Processing room of the Psychocentre Patrick Vane let out a long sigh. He had taken the first step and it had been a great one, but he knew that there was still much to be

done and there would be Margaret to help him—Margaret and the others.

The walls of the room blurred, then. He felt a strange suction within his mind, a pulling back, a strain. And then the cool green waters closed about his head and the voice said words to his mind, the deep voice, the probing voice . . .

"You have seen the Path?"

"I have seen it."

"That can be *The Path*. It can be the centre line on the Fan if you wish it. It is in your power to make the Reality out of what is as yet still but a Probability."

The voice. The deep voice. Always the voice questioning him, demanding answers. And it was a voice he could not ignore, could not put away from him even here in the emerald water depths of peace and ebbing dreamings. His mind spoke upwards through the eternities of time and green spaces: "I will use the power. I will turn the Probability into Reality. The Path I have seen shall be *The Path*."

"Then sleep now. Sleep for an hour more, and then awaken. By then the effects of the drug will have left you and you will be rested and

strong. But do not sleep longer than an hour."

The green world darkened from emerald to turquoise and then to a gloom of inky purple, and within it Patrick Vane slept a deep, untroubled sleep for exactly one hour.

Dr. Allard looked nervously at the hands of the clock on the wall of the Processing room, then down at his patient, who was sleeping in the surgery chair.

He was nervous because he knew that the Night Lights of the whole City had been switched off some twenty minutes before and the Sun Lights switched on. Soon the first workers would be arriving at the Psychocentre, and if anything had gone wrong and the boy didn't come out . . .

He looked at the clock hands yet again. The time was up. The drugs should have worn off by now and—

Patrick Vane stirred in the chair, stirred, sat up, blinked twice and then got to his feet.

Tentatively the doctor pushed out the feelers of his mind in telepathic exploration. Then his mouth fell open in amazement at the power possessed by that other mind.

A second or so passed with neither of them moving.

Dr. Allard felt the cold shimmerings of wonder passing over his body. He had anticipated power, yes, but not *this* much power, and never this much grasp of the way in which the power could be controlled and used. He'd expected that they'd have to talk and plan and make decisions together.

"Now?" asked Patrick Vane, simply.

The awed psychologist gave the slightest of nods perhaps a second after the question was put to him. But there was no need for him to have done it, since Patrick already knew what the answer would be.

And the nod was lost on Patrick, anyway, since Patrick was particularly—busy.

The Hydrogen Bomb

by The Editor

AT the time of going to press the ordinary peoples of the world and the world's newspapers are registering profound misgivings about the form of atomic energy release known as the "hydrogen bomb." The misgivings seem somewhat exaggerated, or at least belated. True, the general populace is not in such a privileged position as the science fiction reading public—who have been on intimate terms with hydrogen bombs for a good many years—but even the man in the street has not really been taken by surprise. The possibility of the hydrogen bomb was mooted immediately after the more conventional atomic bomb was exploded, and experts soon pointed out that its construction did not involve insuperable difficulties.

The atomic bomb, as most people are aware by now, owes its destructive power to the breakdown of atomic nuclei. A nucleus such as that of the uranium atom is split into its constituent parts, the energy released in the process being so great that a devastating

explosion occurs. The hydrogen bomb is a direct reversal of this procedure. Whereas the atomic bomb works by atomic fission, the hydrogen bomb works by atomic fusion.

For very many years it has been known that there was something rather odd about the lighter elements of the periodic system. In these, the demonstrable mass of the nucleus is not quite as great as the sum of the masses of the component nuclear particles. Helium, for example, has a mass of 4.00386 units. Yet helium is composed of two protons and two neutrons, and the total mass of these four particles is 4.03412 units. Thus, there is a so-called "mass defect" of 0.03026 units for the helium atom. The whole basis of the hydrogen bomb—which only very loosely describes it—is that if you take two protons and two neutrons and get them to stick together to form a helium nucleus, then 0.03412 units of energy will be released in the process.

Ordinary hydrogen has only a single proton and no neu-

trons in its nucleus, and so is almost useless for taking part in fusion reactions—neutrons would have to be obtained from somewhere else. But heavy hydrogen—deuterium—has a nucleus composed of a single proton *and* a single neutron. It can readily be seen that if two such nuclei combine—the result is a helium nucleus. The “particle” that consists of a proton and a neutron locked together is called a deuteron.

Another such composite particle is the triton. This consists of one proton and two neutrons, and forms the nucleus of the artificial element, tritium.

Now, theoretically, an energy surplus will occur when two or more of any of these particles conjoin. In nature, however, it is found that only certain types of conjoining are effective. When proton links with proton, if such a thing ever occurs, the reaction takes place very slowly, and the released energy is dissipated slowly and not explosively. When a deuteron sticks itself to a proton to form a light isotope of helium, the energy release is rather faster but still not rapid enough to make a worthwhile bomb.

It is now generally accepted—though, naturally, the full details are a close secret—that the hydrogen bomb works either by conjoining deuteron to deuteron, or by conjoining deuteron to triton. In the first case, heavy hydrogen nuclei can combine in two ways—to form the light isotope of helium and neutrons, or to form tritium and non-heavy hydrogen. Both of these reactions are incredibly fast. But faster still is the reaction of triton to deuteron, forming helium. Which of these reactions is actually used in the Pacific hydrogen bombs will depend largely upon economic and production factors. Either will make a pretty annihilating bomb!

So now we have seen what kind of materials we need to make a hydrogen bomb, but we have not yet discussed what to do with them. All we know at this point is that the basic particles must be conjoined. How do we conjoin them?

The problem is somewhat similar in the atomic bomb, only on a larger scale. There, two chunks of fissile material have to be flung together at great speed; in the hydrogen bomb protons and neutrons—or their deuteron-triton com-

plexes—have to be compressed in much the same way. Herein lies the most difficult part of H-bomb development, for it is by no means easy to force these nuclear particles up against each other. One of the reasons why the lightest of the light elements are used—even though the energy release gets greater with increasing weight—is that this conjoining is easier with them than with the heavier elements.

Now, although the atomic bomb can function if the two pieces of fissile material are hurled at each other by the force of, say, a spring, or a small explosion of gunpowder or T.N.T., this will not work with fusion processes. Indeed, it has been found that there is no natural process that will supply enough "push" to get the separate fusion particles together quickly enough. Not on Earth anyway. The only place where natural processes are sufficiently powerful is the interior of the Sun!

This should supply a clue. One of the ways in which nuclear particles can be made to move extremely rapidly is by heating them. Or, rather, by heating the material in which they occur. Heat itself is simply motion—atomic, molecular or sub-atomic. The

hotter a thing is, any thing, the faster are its constituent atoms or molecules moving. In gases the molecules rush about freely, but in solids they oscillate about fairly fixed points. The number of oscillations in a solid, or the distance travelled in unit time in a gas, are dependent solely upon the temperature of the solid or gas. Thus, by raising the temperature of a mixture of heavy hydrogen, say, and tritium, the basic particles can be made to travel at enormous speeds, and consequently crash into each other with tremendous force.

But a candle will not do it! Nor will the most powerful furnace in creation. The only way to get a high enough temperature to cause the particles to hit each other with enough force to combine and give off the "mass defect" energy, is to raise the temperature to a couple of million degrees Centigrade. And we know of only one way of doing that—by letting off an atomic bomb.

So it is that the complete device known as a hydrogen bomb includes an atomic bomb, which acts as a kind of detonator to the rest of the assembly. The tremendous temperature reached during the atomic blast is maintained

for only a tiny fraction of a second, but it lasts long enough to get a few conjoining reactions going. These then release enough energy to maintain the reaction, and the whole thing becomes a chain of rapidly increasing numbers of collisions—similar in many ways to the chain reaction in the atomic bomb. In time—an incredibly short time, by our standards—enough energy is produced within the chain to support the sudden conjoining of all the other particles. Then the balloon goes up!

Yet although all these things have been happening, millions of collisions occurring, the time from the explosion of the atomic bomb to the explosion of the fusion section would still be less than a second. The actual figure is a secret, but experts believe that the interval of time is so short that it could not be measured in the ordinary way. It may be of the order of a few millionths of a second!

The destructive power of the hydrogen bomb, as observed in the Pacific, has been broadcast far and wide, and has given rise to a certain amount of disquietude. Yet the main danger of this weapon has not, as far as we know, been mentioned for a

long time. True, the hydrogen bomb tends to destroy everything within up to ten or so miles of the explosion centre. True, it sends radioactive clouds half-way, or even all the way, round the world. True, it poisons the water and kills the fish and burns unsuspecting fishermen and generally wreaks havoc all around. But these things are but pin-pricks to what it might do if given the chance.

Can you imagine this whole planet acting as a hydrogen bomb? Just as in the man-made device there are fusion materials and a detonator, so the Earth hangs in space as a huge mass of fusion material—and the hydrogen bomb reposes in stockpiles as the detonator.

What is the theoretical background to this? Is it mere exaggeration and sensational speculation? Who knows? Maybe somebody does, but if so, then he isn't talking. But there definitely is a sound physical basis for the fear that the hydrogen bomb—or its near successors—may start a chain reaction involving the whole world. This is the theory:

It is quite simple. We have already pointed out that if you raise the temperature of fusion

material high enough, the speed of collisions will be great enough to start a conjoining chain reaction, with release of tremendous amounts of energy. The heat for this process—in the hydrogen bomb—is supplied by the atomic bomb. But the hydrogen bomb produces heat, too. What could *that* heat be used for? The dreadful answer is this: if there were enough of it, it could be used to detonate the heavy hydrogen of the oceans!

Water, as most people are aware, is composed of oxygen and hydrogen and some of the hydrogen is deuterium. It is theoretically possible to raise the temperature of water so high that the atoms of deuterium will be dragged off the atoms of oxygen; and then the electrons will be dragged off the deuterium nuclei; and then

the protons of the deuterium nuclei may conjoin; and then—well, perhaps we'd better not think about that. All we need to bear in mind is that the entire oceans and seas would go up in a gigantic, roaring explosion that would make previous hydrogen bomb let-offs look like toy cap percussions. The world would most certainly be completely vapourised.

That is the theory. It is not officially known whether it is also practicable. Though the hydrogen bomb itself may not be able to develop such high temperatures, it is possible that bombs made from the fusion of heavier elements *might* create the right degree of heat. Practically, we can find out only once, and that would be too often. Let us hope that science fiction, in this respect, is not true to life.

Outside—Looking in

by RON ELTON

THE Doctor had a daughter, so I've got pretty rich. Or rather I haven't, but the chap who . . . well, I suppose it is me.

I said he *had* a daughter—actually he's still got her, but as far as I'm concerned he might just as well be a bachelor.

Or an Eskimo.

I wish he was an Eskimo, then I shouldn't be where I am now. Neither should I be rich. Or rather the chap who . . . Look, this is getting us nowhere—I'll start at the beginning.

We'll start with the Staff Dance. The Staff being Permanent Plastics, Ltd.—“We make 'em—try and break 'em”—where I am (was) a warehouseman.

P.P. pride themselves on their modern outlook on Capital and Labour, the let's-all-be-workmates-together sort of thing, and, provided you don't call the Managing Director Charley, to his face, you get on all right.

So that when I had a dance with Browneyes, sat the next

one out with her on the veranda, and after we'd come up from the clinch for breath, I asked her name, and she said “Beryl Jameson,” I didn't drop dead from shock. Even though I knew her old man was top-dog in the Research Labs.

I took her home after the dance, said “good-night” in the approved fashion, and caught an all-night 'bus to Shepherds Bush, with one of those who-is-this-bloke-called-Boyer feelings.

Naturally I had dated Browneyes, and we did a West End show, with a feed in Lyons' to follow. And that's how the great romance started.

Of course, on seven quid a week, you can't do the West End every night, but we made out all right, with the local gaff, and down by the river at Hammersmith.

Oh yes, we reached the every-night stage, and pretty soon she said to me: “Would you like to meet Daddy?”

“I do,” I told her. “Every day.”

"No, dear," she laughed. "I mean at home."

Influence is a fine thing, even at P.P., and anyhow, I was beginning to think of settling down, so I said "O.K."

Doctor Jameson, F.R.S., wasn't at all a bad old stick. Apart from being a Chelsea supporter, he was almost human. "Come round, by all means, laddie," said he. "Drop in any time you feel like it." And that's how the Thursday discussion group began.

Thursday being Browneyes' night for her Amateur Theatricals, the discussion group consisted of: (a) Doc Jameson, speaker, and (b) me, audience.

I'll make this clear now.

Although I'm a member—was a member—of P.P.—"Products of the Future, Today"—I'm a warehouseman. One of the boys in the basement, who pack the finished article for delivery. When I visit the Labs it's with a brush in my hand to sweep up. My scientific knowledge consists of two things— H_2O , and CO_2 . When I've said those, scientifically that's my lot.

I'm a science fiction fan and have been for years, but purely of the B.E.M. group. When somebody starts in to describe the overdrive, or to

work out the Nth Power of something or other, I skip that bit, and carry on with the story when it comes back to my level.

So most of what the Doc said was way over my head. I gathered, quite early in the proceedings, however, that his heart wasn't in Plastics, and that he had a lab. of his own, in the house.

The plot thickens.

Then, one Thursday night, I got what he was talking about. I'd formed the habit of listening with one ear, while pursuing my own train of thought, and every time he paused I'd make some non-committal sort of noise and off he'd go again.

This night I was playing centre forward for the Rangers and had just scored the winning goal at Wembley when I caught the words "space-time continuum."

This, being science fiction stuff, was more or less up my street, so, telling the vice-captain to look after the cup, I came back to earth.

"—was beyond all reasonable doubt," he was saying. "So it remained only to see if the same applied to living organisms. My first attempt, with a mouse, was successful at twenty seconds, and . . ."

He paused, and, pointing dramatically to Jimmy-boy the cat, sitting placidly in front of the fire, said: "... and there is proof of my second."

Obviously he'd expect something more than a non-committal grunt this time, so, looking suitably impressed, I gasped: "Great Scott! You mean . . . ?"

I didn't know what he was talking about, but I soon found out, for . . .

"Yes," he said, in a voice that mentally patted himself on the back. "Jimmy spent five minutes in the twelfth century and came back as right as rain."

Good Heavens! Time machines!

He stood up. "Come and see it," he said.

I've always wanted to see a time machine, so I followed him to the back of the house, to his lab, prepared to go all agog at the powerful, yet graceful lines of the projectile. Oram I thinking of spaceships? Anyhow, there was no projectile, no graceful lines. Not even a metal chamber with a dark, sinister doorway. All I could see was a wooden table with half a dozen arc lamps over it, and, in the corner, a Heath Robinson contraption of wires, dials

and switches. The table, though, when I took a closer look, wasn't wood at all but some kind of plastic, new to me, and I lived among the blinking stuff.

The Doc saw me poking it about, and said: "This is the discovery I made." He patted the table. "As I told you it has unique shift properties."

"Oh yes, of course," I replied brightly, wondering what a shift property looked like when it was out.

"I've explained about the lamps," he went on, "and that's the Klystron on the panel." He waved his hand vaguely towards the corner.

I replied: "Quite."

"I think that's all," he said. Then he turned to me, quite casually. "Well, would you like a trip?"

I had a strong idea that something like this was coming, and had been going over a few facts in my mind.

Fact A—Only people in S.F. build time machines.

Fact B—if time travel were possible, somebody from the future would have bobbed up here now, to have a gander at us. Therefore, time travel couldn't be done.

Fact C—the table, where the body, apparently, went was not, as far as I could see,

connected to any wires or suchlike, and would probably be the safest place to be when he started mucking about with switches.

Also I had spotted something that I was going to use as an extra safeguard, when his back was turned, at the panel, so . . .

"Sure," I said. "I don't mind."

"Stout fella. It will be a five minute trip, and when you return I'll show you what to do, and I'll have a go myself."

That's what I liked about the Doc. None of this "pioneers-of-science . . . for-the-glory - of - the Empire" stuff about him. Just a matter-of-fact, take-it-or-leave-it approach. Which is partly why I took it.

He turned towards the panel. "Up on the table, then, while I switch on. It takes a little time for the power to build up."

He started fiddling about with relays and switches, and I grabbed the rubber mat which I had spotted, laid it on the table, and climbed onto it. It was near enough the same colour as the table, and I didn't think he'd notice it.

And so, properly insulated

just in case, I laid me down to rest.

"Any particular period you fancy?" he said over his shoulder.

I had an answer for that one, too. After all, in case there was anything in this business, I might as well have my money's worth, so . . .

"1666" I said.

"Wise choice," said the Doc, doing things at the panel to make me a spectator at the Great Fire, and I closed my eyes tight as the arcs over my head started to flicker and brighten.

"Ready?"

"Shoot," said I.

"Right. See you in five minutes, then," and I heard the *klonk* of a final switch.

Then came a flash, a bump, a feeling of flying through the air, another bump, and I opened my eyes to find myself in the Doc's back garden.

"Strewth!" I thought, "that's dangerous. Lucky I wasn't killed." I looked back at his lab window to see the hole I must have made, coming through. Only there was no hole. The lab window was all in one piece, as it shone in the sunlight.

Sunlight! At eight o'clock on a February evening!

I sat gazing at the window,

open-mouthed, and should probably be there still, if Browneyes hadn't appeared at the back door with a table-cloth in her hand.

"Gosh, ducks," I said.
"What's happened?"

She ignored me, and began to shake the cloth, watched closely by a gang of fat sparrows on the fence.

"Hi, Beryl!" I yelled.

She looked up, at me, through me, all over the local landscape, then looked over her shoulder and said something inside the house. She laughed, shook her head and went in, closing the door. I didn't like this one little bit, and there was something else nagging at the back of my mind. I suddenly tumbled what it was.

The silence! I couldn't hear a darn' thing but a distant rumbling sort of rustle: Ever held a sea shell close to your ear? That kind of noise.

I walked slowly up the garden path with a finger plunged deep into each ear, shaking up the interior furnishings, but it made not the slightest difference. I still couldn't hear, and I supposed my recent adventures must have disorganised my intercom. Just temporaril, I hoped.

I had a vague idea of con-

fronting the Doc, but it was only a vague idea. All my ideas were vague right then. I hadn't got over the sunlight yet.

I reached the back door and, with my hand out to grasp the knob, I stopped and looked back. The sparrows were all on the ground, tucking into their breakfasts. Not an unusual sight, except that I had passed that way, not two seconds ago.

I walked back to them and stood on the edge of the crowd. For all the notice they took of me I might not have been there at all.

I knelt on the ground close to the fattest one there and yelled "*Boo!*" at him. He flew six inches in the air, came back, and carried on eating, with a sort of shame-faced look about him.

Apparently I *wasn't* there.

O.K. Then, where was I?

Obviously not in 1666. And thinking of that reminded me that I was due back at the end of five minutes, so I guessed I'd better get back to where I was till I was called for.

I went back to my landing place and waited for the call. While I was hanging around I was trying to make my listening apparatus work by

will power—you know, straining my ear drums, and flapping my ears to pick up sounds. The result was that I gave myself a headache all to no purpose. Then amid the rumbling rustle another sound started, no louder, but it had a rhythm to it. I listened to it for a while, then—"S'welp me," I thought. "Church bells!"

After that it was easy. All the sounds were there as usual, but muffled, as though a long way off, and with a bit of practice I could isolate a few of them. Church bells, for instance, a motor revving up, and the unmistakable sound of a jet going somewhere in a hurry.

Well, I hung around waiting to be picked up for about half an hour before I came to the conclusion that there was to be no collection that day, at least. Then, up the garden path again to see the Doc, although what I expected to happen I don't quite know. I mean if sparrows couldn't see me, then it was more than likely doctors couldn't either. And if I couldn't hear him, then I don't suppose he could hear me. However, we could but try.

As I reached the back door again who should come tear-

ing out but the Doc himself, no less. He was clutching a trowel and a bundle of young plants wrapped in newspaper. He was moving fast, intent on getting to his destination before the wet newspaper gave way and scattered his plants to the four winds of heaven. He was heading straight for invisible me, so I sidestepped hurriedly.

I wasn't quite quick enough though, and realising we were going to collide, I did a mental grin and thought: "Somebody's going to get such a shock, soon."

Somebody did, but it wasn't the Doc. He just walked through me, and carried on down the garden, leaving behind him a nervous wreck that had suddenly realised that it was not only invisible but walk-throughable to boot.

This, as Shakespeare puts it, was the unkindest cut of all. Nothing could happen now, thought I, to make things worse.

As usual, I was dead wrong.

While I was standing there debating my next move the cook poked her head round the back door, and slung a lump of bread at me.

It was a gift for the fat sparrow—the official family dustbin—really, and I just

happened to be in the way. I ducked instinctively, but it was through me before I was half way down, and by the time I'd turned round the fat sparrow was onto it, savaging the life out of it.

I watched him for a few seconds, then a horrible thought crept up on me.

If people could walk through me and sling crusts through me, then by the same token I couldn't pick any material thing up. Food is a material thing, so what does that make me?

The obvious answer is hungry, and I felt the first faint stirrings deep in my stomach that always come when I think of food. I walked over to the sparrow to see if I could swipe his elevenses—not to eat them of course, but to see if my theory held water.

It might have held water, but it certainly couldn't hold bread. My fingers just went through that crust as though it were smoke, and the faint stirrings in my stomach grew into a fully-fledged, hundred per cent. starvation feeling.

Black despair crept up, and gave me a hearty smack on the back. "Never mind, Tosh!" he roared. "Smashing death, starvation. All you've got to

do is sit and think of sausages and chips, steak and kidney pudding, jam roly-poly and custard, cups of tea . . .!"

I uttered a hollow laugh and wandered along the side passage of the Doc's house, towards the front gate. I had lost all interest in women, scientists and laboratories. All I wanted was food.

As I went I instinctively reached for a cigarette and, rather to my surprise, they were in my pocket as usual, complete with lighter. I lit up, half expecting the whole place to go sky-high as I did so, but I was spared that, at least. I stood by the Doc's front gate enjoying the solace of Lady Nicotine.

Wonderful what a cigarette will do to you, isn't it? I began to feel almost human again, and started churning over a few facts in what in my lighter moments I call my brain.

Firstly: my watch was still ticking, and I could still think dirty thoughts (I tried one to see): so I wasn't dead. In addition, the only angel I'd seen to date was Browneyes, and as she wore neither wings nor a shiny nightdress, she wasn't one of the regular ones.

Secondly: everything that was with me on that fatal

night was with me still. That, of course, was self-evident, otherwise I should be mooching about stark naked. But I mean the contents of my pockets—fags, money, etc.

I began searching them, half hoping to find a four course dinner somewhere, and did manage to rake up a caramel, and a solitary section off a block of milk chocolate—relics of the last time Brown-eyes and I went to the pictures.

The chocolate was minus silver paper and liberally coated with fluff and tobacco dust. However . . .

Fact three came with a boy on a bike. He was delivering newspapers and, as he entered the Doc's house, I saw the *News of the World*. So I knew it was Sunday.

The date, according to the papers in the luggage rack thing on the front of his bike, was October 24th, 1953. "Last night" was February 25th, 1954, so I was four months adrift and rather late for the Great Fire.

"The last Sunday in October," mused I. "That was before I met Browneyes. I had a date with that redhead from P.P., and we . . ." I stopped, pondered, and

arrived at the following conclusions.

"If I'm here, I can't be there as well. But that was *then*, while this is—er—*then* too, I suppose. So, if 'I' meet her, 'outside,' today I can watch 'me' do it. Then there must be two of me—like a split personality, perhaps. Good. Then—whoa—that's not right, for if I can see 'me' now, then another 'I' must have been watching me when I was outside. If so, he's still here somewhere, and if I meet him, then there's three of us.

It would probably sound better set to music.

There was only one thing to do—go to Shepherds Bush and see me for myself.

It was then that I saw the streak.

Though, come to think of it, I had seen it for quite a while but had other things to worry about, as it was not a conspicuous sort of streak at all, but one of those "out of the corner of your eye" objects.

You know what the shadow of a cloud is like, tearing across the ground in the distance? Well, it was that sort of thing, only (a) it wasn't there when you looked direct, and (b) it wasn't tearing anywhere, but bobbed up

—out of the corner of your eye—in all directions.

By screwing my eyeballs round almost to my ears, I was able to pin it down and decided that it was heat haze holding close to the ground. Then the sun took time out behind a cloud and I decided that it wasn't, for it grew more distinct and I was able to trace it along the ground almost to my feet, running locally at just above pavement level, filling the roadway and...

For a science fiction fan I was a disgrace to my publishers. Invisible, inaudible, walk-throughable—it stuck out a mile what the streak was. Earth, ground or whatever you like to call it.

Seems like I'd got myself a transfer altogether, even having my own soil to walk on.

I did a quick check up with my feet. As I thought, I was poised half an inch above the normal pavement. Looking straight down, my ground was invisible, though it felt solid enough. Presumably I'd been a little above ground level all the time, but in my bemused condition I wouldn't have noticed a mere half inch or so.

I wondered if my earth followed the contours of the one outside, because if it

didn't, I should have to "gang warily" . . . very warily.

The scene changes to High Street, Kensington. I was on my way to Shepherds Bush, and had got this far without anything extraordinary happening, my ground behaving reasonably well, so that I was seldom more than a couple of feet either above or below the outside ground level—until I reached Kensington Church Street, which is a hill.

My normal route to my digs was along said Church Street, but as my ground seemed determined to keep its own level I was faced with the choice of either going through the hill or round it. I got nearly neck deep, then lost my nerve and beat it back to the leveller High Street. It was a darned sight farther, going via Hammersmith Broadway, but it was flatter—I hoped.

I was in no hurry, however, as I wouldn't be meeting the redhead until six o'clock, and according to the public clocks in the vicinity, the time was something between 1.50 and 2.05. So I took it easy, smoking and watching the "walk-throughables" going by.

There was a nice little blonde standing outside of the Underground Arcade, and as I sauntered past, secure in my invisibility, I murmured, politely: "How d'ye do."

"Greetings," she replied. "Where's your party?"

That stopped me—with a jerk. I stood yammering for a second or so, and finally managed to come out with: "Good Heavens! Can you see me?" Which, I suppose, is as daft a question as I've ever asked anyone.

She burst out laughing. "Of course I can. This is your first time through, isn't it? Don't wander too far from your party, will you?"

"Party?" said I, like a dim-witted parrot.

She waved back into the Arcade, and I saw half a dozen people watching us, hanging about self-consciously, like Englishmen who haven't been introduced.

"Party," she said. "That's a party. You *must* have one, somewhere. What period are you from?"

That was it. The good old science fiction formula. So this is where time travellers get, is it. No wonder nobody's ever seen them. I felt loads better, thinking that I wasn't stuck here for good, and I

laughed light-heartedly, replying light-headedly: "No. No party. Lone scout, me. I'm from next year, and ought to be in the seventeenth century but through a technical hitch this is as far as I've got."

"Oh dear," she said. "Then you're channelled."

"That," said I, "is a nice way of putting it, although it's hardly a lady-like thing to suggest—unless you mean something else."

Instead of answering, she beckoned the rest of the gang, and as they came trooping up she introduced me. Like this:

"Meet the newest channeller."

The "channel" is the no-man's-land running parallel to the "outside"—or "inside," depending on your position—and is there for the express purpose, as far as I can see, of making time-travel possible.

It works this way. When a would-be traveller enters the "Projection Field," said field alters his "wavelength" enough to make him permeable to the "channel" wall—or the channel wall permeable to him, one of the two. Then he is shoved down the channel to whatever period he wants to look at, stays there till he's had his

bob's worth, pulled back again to his "present," re-wavelengthed, and there he is.

If, however, he does something that the Field doesn't agree with, he doesn't last long. The procedure being almost instantaneous, he's in the channel and starting his journey before the Field can take the necessary action to clear itself.

My trouble, as the gang explained enthusiastically, was this. I took a rubber mat, to lie on. The part of the Field flowing between the arc-lamps and the plastic "projector" was partially blocked by it. And the circuit promptly cleared itself by ejecting this as quickly as it could. Unfortunately, I was on top of it, so I got ejected too.

And, once ejected, you stay ejected. When that sank in and I found I was here for keeps, I didn't exactly jump for joy, but the blonde said:

"Cheer up. You're not the only one over here in this predicament—not by a long way. You'll have plenty of company, both from normal visitors as well as channellers."

"That," I said, "is something, I suppose, but touching on the matter of food—how do I eat?" An important

question, this, to a chap that's only had one caramel and one tiny piece of chocolate in four months.

"Like all of us stranded here," said the blonde, "you will be a guide. You'll have a Tours Itinerary delivered weekly, giving details of parties operating, period and place to be visited, route to be taken, etc. Your food and other necessities will come with it. Each of us guides work two parties a week, spending a couple of days in the place chosen before the party arrives. That way we know the best way to proceed when they do come. Incidentally, you will have a guide with you for a time to instruct you—and I expect it will be me."

Actually she didn't say that at all at the time but handed me a super sandwich, and while I was polishing it off I got the above information. I'm just sacrificing veracity on the altar of continuity.

I'm settling down quite nicely, thank you, and June—the blonde—has shifted her quarters to the 20th century. Apparently there is quite a number of channellers in the 22nd century where she comes from, since that's where this

time travel lark first starts, which makes me a what-d'yecall-it? An anachronism.

I've seen quite a few scientists and chronologists from up ahead, and not one of them has heard of the Doc's experiments. One, the Einstein of his time, no doubt, put it down to the Final War, which, being due in the not too distant future, probably wiped out all records. They've never studied the Doc's lab, because they've had no reason to.

There was . . . eh? Oh, this Final War. No, I'm not telling you the date. You'll find out soon enough, when it comes.

As I was saying, there was another reason why Einstein II came to see me, and it's this.

Until I bobbed up, every channeller had been carried back some hundred years or more from their starting point before they were dumped off the Field. As natural laws work the same this side as they do your side, they always die before they re-reach the time when they came in.

Sonobody knew what would happen to a living person who caught up with himself from inside. If you see what I mean.

I, therefore, having but a few months to go, seem to be

the answer to the research worker's prayer, and on The Night there will be a couple of "observers" in the Doc's lab with me, as the favourite theory seems to be that when I get level with my "wavelength" radiations again I shall get pulled back inside.

There was nobody—no other "me"—in this place, before I came, but that's quite in order apparently, as, according to this Einstein bloke—" . . . the past is generally more fluid than was once supposed. Small incidents can and do vary from time to time, but the general pattern of events remains constant."

The idea being, as far as I can see, that as long as there is a "me" outside to carry on with the good work, it doesn't matter which one it is. So if I get taken back in the place of the "me" which makes the trip, it may set up a sequence of events to be followed by all future "me's"—at four monthly intervals.

"There's a flaw there," said I, in another of my lucid moments, "for there was nobody to take my place when I came through." I thought that was unanswerable, but Tosh had one all ready for me.

"Did you," he asked me, "always wait at your Doctor's

house till your—er—Brown-eyes returned?"

"Good Heavens, no," I told him. "She never got back till after eleven—and I had to be at work at seven next day."

"So your Doctor could say that you left as usual, and he would not be expected to know your future movements. People *do* disappear from your world, don't they?"

"But what about my effect on the future?"

He smiled, rather sadly. "You, like a million more of your age, will have no effect at all on the future in a general sense. Remember, the Final War has yet to come, and your Future Probability line, like so many others, ends right there."

"Oh!"

"Events," he went on, "like to follow systematically when they can, but often there is a slip. Sufficient slips and the whole programme has to be overhauled—usually by a war, which irons out the inconsequences. Since the time-travel era, we've been able to remove that cause for war, I'm thankful to say."

Well, I suppose I should have been overjoyed at the thought of getting "outside" again, but . . .

I've got a smashing job

with bags of travel—into the past only; there is no future in this game. I've a nice little pre-fab where I—ahem, we—live. And the food—it's out of this world. Literally. Have you ever tasted Martian Pear? Or had Ki-Ki fruit from Venus as afters?

Then there's this war. No, I'm much better off in here, and as far as I could see the only way to stay was to do a spot of sequence altering of my own.

This was in November, and I didn't—or won't—meet Browneyes until the staff dance in early January. Stop that, and I don't meet the Doc. If I don't meet the Doc I don't do a time-trip, so I—the real I, me—can stay here for good.

If "I" am not working at P.P. in January, then "I" don't go to the staff dance, but how . . . ?

I got the answer the very next day. June and I often amused ourselves by yelling in people's ears, and watched the look on their faces as they turned to see where the—to them—faint whisper came from. And that gave me an idea.

The next Wednesday evening I went over to the digs at Shepherds Bush and, as I

thought, there was "I", doing what I used to do on a Wednesday—filling in his Pool coupon.

I waited while he did the preliminary form finding, then as he picked up his pen to enter the results on his coupon, I took a deep breath and stepped forward.

Football's my hobby, and I can tell you, off-hand, most of the present season's results, to date, so . . .

His pen hovered over the Treble Chance section. No. 1, Aston Villa. But they won at home that week. He, naturally not knowing this, was all set to put a big fat O by the side of them when I took over. "No!" I yelled. "Number 4 . . . 4 . . . 4."

A strange look came into his eyes, and he hesitated.

"Four . . . 4 . . . 4 . . . you clot," I yelled, and had the satisfaction of seeing him put Charlton down for a draw.

I went all through the list with him and when I left, with a lovely sore throat, he was £75,000 better off, though he didn't know it yet. There were only eight draws that week, and he had 'em all.

He's got a nice little self-contained flat now. Regents

Park way, and he doesn't work at P.P. any more. He's been in the papers, too, as The Man who did it twice. Yep, two weeks running I gave him an all-correct, and was going to give him another, but the damn' fool went and joined an Amateur Dramatic Society. The one that Browneyes goes to.

Tonight is Thursday, February 25th, 1954. The Night. June and I are in the Doc's house, along with the two "observers." I was laughing to myself coming across for, while he is Browneyes' "regular," Thursday being Dramatics night, neither of them should be in.

Mug, however, has a cold or something, and has decided to stay home with the Doc, while Browneyes goes acting alone. So there we are. There's nothing I can do now except keep my fingers crossed and hope for the best.

If he doesn't take the rubber mat with him, I've got a chance, but if he does . . .

The Doc has just pointed to Jimmy-boy, the cat.

Here it comes.

"Come and see it," says the Doc.

They leave the room . . .

LOGIC IS FUN—2

IN this second article in this series, we are going to see what one can *infer* from given propositions—but first, let's look at the homework we gave you for last month. Did you do it? It doesn't matter very much if you didn't. Anyway, for those who did, here are the answers: 1, Universal affirmative; 2, Singular universal affirmative; 3, Implicative or disjunctive; 4, Alternative; 5, Conjunctive.

Now we can go ahead with inference. There are two forms at least of this—immediate inference and mediate inference. Broadly, the difference is that in the first, you infer something from one proposition; and in the second case, you infer something from two propositions. We'll deal with immediate inference first.

To begin with, the four classical categorical propositions that we dealt with last month fall into their own little set of inferential relationships. You will remember that the four propositions are as follow (the symbolic form is shown in brackets): All S is P (*SaP*), No S is P (*SeP*), Some S is P (*SiP*), Some S is not P (*SoP*), where S stands for the subject and P for the predicate. Now given the truth or falsity of any one of these propositions, you can determine the truth or falsity of most of the others. Sometimes you just cannot tell. The following table shows you what you can infer and what you cannot:

Given that	it can be inferred that
<i>SaP</i> is true	<i>SeP</i> is false, <i>SiP</i> is true, <i>SoP</i> is false.
<i>SaP</i> is false	<i>SeP</i> is ?, <i>SiP</i> is ?, <i>SoP</i> is true.
<i>SeP</i> is true	<i>SaP</i> is false, <i>SiP</i> is false, <i>SoP</i> is true.
<i>SeP</i> is false	<i>SaP</i> is ?, <i>SiP</i> is true, <i>SoP</i> is ?
<i>SiP</i> is true	<i>SaP</i> is ?, <i>SeP</i> is false, <i>SoP</i> is ?
<i>SiP</i> is false	<i>SaP</i> is false, <i>SeP</i> is true, <i>SoP</i> is true.
<i>SoP</i> is true	<i>SaP</i> is false, <i>SeP</i> is ?, <i>SiP</i> is ?
<i>SoP</i> is false	<i>SaP</i> is true, <i>SeP</i> is false, <i>SiP</i> is true.

Don't bother to memorise all this, but copy it out into a notebook so that it will be available for reference. Never clutter up your memory with things that are better looked up in a book! If you construct real sets of propositions and test them out against this table, you will probably come to agree with it. At least I hope you will, for it's true.

The things inferred in that scheme above form a part of immediate inference, but not a very important part. Indeed, it has been stated many times that *no* part of immediate inference is of much importance! Still, we might as well have a look and see what it is all about. After all, I'm not trying to teach you logic in these articles—only to show you what logic is. If you want to learn it you'll have to read the standard textbooks.

The next part of immediate inference with which we'll deal has sometimes been called eduction, and it is a process whereby we arrive at equivalent propositions, *i.e.*, propositions which say much the same thing in different words as the original proposition. Some people say, and you may agree with them, that simply saying something in other words will not get you anywhere. True it is that nothing *new* can come of it, but it may enable you to find something new by making thinking easier. After all, a slide rule will not enable the user to discover new mathematical truths—but it makes doing sums a pleasure! So you must look upon eduction as a kind of device for looking at things from different angles in the hope that a new idea might be suggested to you that way.

Once again, we deal with the classical categorical propositions. These all express a relationship of S to P. In eduction we make them state other relations, such as P to S, non-S to non-P, and so on. The first thing we can do is to *convert* our original proposition. Thus, SaP becomes PiS, SeP becomes PeS, SiP becomes PiS, and SoP becomes—ah, but there's the first rub, for this proposition cannot be converted. Since I'm

not teaching you logic and, therefore, will not be giving you the rules for eduction, you'll just have to take my word for it that it cannot be done. (Anyone who wants the rules should write to me, care of the Editor, and I will send them.)

Let us just take a look at conversion using a real proposition. We can start off with the proposition "All planets have mass." This converts to "Some bodies with mass are planets." If we had started with "No planets have mass," we would have converted to "No bodies with mass are planets," which, although demonstrably untrue is nevertheless logical. Deductive logic does not help you to discover whether your original propositions are true or false. It simply enables you to say what follows from them if they *are* true. Finding true propositions is the concern of induction and is no easy matter, whereas deduction—finding what follows from true propositions—is relatively simple. Inference is a part of deduction.

That was a side-track. Let us go back to immediate inference. The proposition "Some planets have mass" converts to "Some bodies with mass are planets," and the proposition "Some planets do not have mass" cannot be converted. So much for conversion.

Another process of eduction is making the original proposition state a relationship between S and non-P. This is called *obversion*. The obverse of "All planets have mass" is "No planets are massless bodies" (the actual words used, you will see, are not very important; it is the *meaning* that matters). "No planets have mass" obverts to "All planets are massless bodies," "Some planets have mass" obverts to "Some planets are not massless bodies," and "Some planets do not have mass" obverts to "Some planets are massless." Putting all this into shorthand, it becomes: SaP obverts to Se \bar{P} ; SeP obverts to Sa \bar{P} ; SiP obverts to So \bar{P} ; and SoP obverts to Si \bar{P} . (You will remember that a — over a letter means *non-*.)

So, from our original proposition we have seen how to

obtain a converse and an obverse, both of which must be true if the original proposition is true, and false if it is false. Now we can convert our obverse, and we can obvert our converse. (All these words are confusing at first, but you soon get used to them!) You will remember that the obverse shows the relation between S and non-P; so if we convert it, we shall get a relation between non-P and S. To avoid writing out "converted obverse" each time, we use the term "contrapositive" for this. Thus, the contrapositive of SaP is $\bar{P}eS$, the contrapositive of SeP is $\bar{P}iS$, the contrapositive of SiP is not obtainable—because the obverse of SiP is SoP, and SoP cannot be converted, as we said before—and the contrapositive of SoP is $\bar{P}iS$.

All those inferred propositions were obtained by obverting the original proposition and then converting the obverse. Now we'll do it the other way round. We'll convert the original proposition and then obvert it. That way we arrive at a proposition that states a relation between P and non-S; this is called, as you would expect, the obverted converse. By this procedure, SaP becomes Po \bar{S} ; SeP becomes Pa \bar{S} ; SiP becomes Po \bar{S} ; and SoP cannot be dealt with in this manner.

There are just three more kinds of eduction that we have not yet dealt with. We may as well just look at them so as to make the picture complete. The only possible relations between S and P that we have not yet derived are non-P to non-S, non-S to P, and non-S to non-P. The first is obtained by obverting the contrapositive, the second is called the "inverse" and the third is the "obverted inverse." Here they are:

Obverted contrapositive: SaP becomes $\bar{P}a\bar{S}$; SeP becomes $\bar{P}o\bar{S}$; SoP becomes $\bar{P}o\bar{S}$; and SiP cannot be dealt with in this way. Inverse: SaP becomes $\bar{S}i\bar{P}$; SeP becomes $\bar{S}i\bar{P}$; and neither SiP nor SoP can be inverted. Obverted inverse: SaP becomes $\bar{S}o\bar{P}$; SeP becomes $\bar{S}o\bar{P}$; and neither of the last two propositions can be dealt with in this way.

That's the lot! And I daresay you are glad!

But do, please, get the right attitude to this. There is no need for you to *learn* all these things—not unless you really want to. These articles merely require you to *understand*, so that you will be aware of what logic is. To help you do this, let us take a real proposition and write out in longhand and shorthand all the possible eductions from it: "All stars are coloured" (SaP). Here are the eductions:

Converse: "Some coloured bodies are stars" (PiS).

Obverse: "No stars are colourless" (SeP).

Contrapositive: "No colourless bodies are stars" ($\bar{P}eS$).

Obverted converse: "Some coloured bodies are not nonstellar bodies" (Po \bar{S}).

Obverted contrapositive: "All colourless bodies are non-stellar bodies" ($\bar{P}o\bar{S}$).

Inverse: "Some non-stellar bodies are colourless bodies" ($\bar{S}i\bar{P}$).

Obverted inverse: "Some non-stellar bodies are not coloured" ($\bar{S}oP$).

Those are all the eductions possible from a universal affirmative categorical proposition. If the original proposition is true, then all the eductions are true; if the original proposition is false, then all the eductions are false. As a piece of homework to test your understanding of eduction, I suggest that you work out for yourselves all the possible eductions from "Some stars are coloured" (SiP) and "Some stars are not coloured" (SoP). I'll give you the answers next month.

Meantime let us pass on to another very important set of inferences. This involves the implicative, disjunctive and alternative types of compound propositions, which, you will remember from last month, are symbolised respectively by: $p \supset q$, $\neg p \cdot q$, $p \vee q$. Or, in a little less short shorthand, as If p , then q ; Not both p and q ; Either p or q . These can all be interconverted. A proposition in one form can be altered into each of the other two forms. (You will remember, too,

that p and q each represent a simple proposition.) First, I will give you the inferences, and then I'll write them out using real propositions.

From $p \supset q$ it can be inferred that $\sim p . \bar{q}$ and that $\bar{p} v q$. From $\bar{p} \supset \bar{q}$ it can be inferred that $\sim \bar{p} . q$ and that $p v \bar{q}$. From $p \supset \bar{q}$ it can be inferred that $\sim p . q$ and that $\bar{p} v \bar{q}$. From $\bar{p} \supset q$ it can be inferred that $\sim \bar{p} . \bar{q}$ and that $p v q$.

Now all that may look rather confusing, but it is really very simple. Let's see how it looks when applied to real propositions. For $p \supset q$ we can take "If planets have mass, then they have gravitation." Remember, we are not concerned with the truth or falsity of this proposition; we merely want to see what follows from it if it is true. Well, we can say that it follows that "It is not the case both that planets have mass and do not have gravitation" ($\sim p . \bar{q}$); and we can say that it follows that "Either planets do not have mass or they have gravitation" ($\bar{p} v q$). For our second example, we can take the proposition "If planets are massless, then they are gravity-less" ($\bar{p} \supset \bar{q}$). From this it follows that "It is not the case both that planets are massless and have gravitation" ($\sim \bar{p} . q$) and that it follows that "Either planets have mass or they are gravity-less" ($p v \bar{q}$). And from the proposition "If planets have mass, then they are gravity-less" ($p \supset \bar{q}$) we can infer that "It is not the case both that planets have mass and that they have gravity" ($\sim p . q$) and that "Either planets do not have mass or they are gravity-less" ($\bar{p} v \bar{q}$).

To test your understanding of this type of inference, I suggest that you transform the proposition "If planets are massless, then they have gravity" ($\bar{p} \supset q$) into each of the other forms, and I'll tell you the answers next month.

This last type of inference plays a most important part in science today. The form of argument it gives rise to we will discuss in the next article in this series, when we will also take a look at that classic form of argument—the syllogism.

**When the back of the mind controls the front,
there may be trouble.**

PSYCHIC TWIN

by DAN MORGAN

It had been realised for over half a century that the day of the lone experimenter was past, but it was not until a syndicate of far seeing financiers founded Research Incorporated that the new era of science truly dawned. The stock in trade of the organisation was . . . Brains. On the fifty floors of the R.I. building, five hundred of the world's top scientists in all major fields worked on research problems submitted by governments and commercial concerns prepared to pay big money for their solution.

(Gregor Segura: Scientific Development In the Twentieth Century).

THE Medical Tech jabbed a hypo into Bridger's arm. He managed to pump in most of the charge before the needle snapped. Bridger's fingers held their maniacal grip for a few more seconds, and then along with the rest of his body, they relaxed into uselessness.

Colson pushed the limp figure of the little physicist to one side and struggled unsteadily to his feet. He fingered the livid marks on his throat gingerly. Six foot three and heavily built, he looked down at the puny body of his late attacker. The usual good-humoured expression on his broad, Irish face was missing. In its place was something like fear.

"Thanks, friend," he said to the medic. "Believe it or not—that little jerk would have killed me. There was nothing I could do that would stop him—he didn't seem to feel a thing."

The Medic bent down and slung Bridger over his shoulder in a practised lift.

"That's my job—keeping people alive," he said in a flat voice. He walked with his burden out of the ground floor canteen of Research Incorporated.

"All right, you people!" shouted Glassberg, the Supervisor, officiously. "The show is over. Let's get back to work, shall we?" The mixed groups of research and maintenance personnel began to dwindle

away, murmuring amongst themselves. Colson made to follow their example.

"Just a moment there," said Glassberg, his rotund figure blocking the exit. "I would like a word with you. Perhaps you would like to explain exactly what happened —this sort of thing is bad for morale, you know."

"The little fellow jumped me, that's all," said Colson. He disliked Glassberg's overzealous manner, and his throat was beginning to feel worse.

"That is obvious," said the Supervisor, icily. "But what led up to the assault? What were you talking about?"

"The usual shop talk," said Colson. "Bridger seemed a bit depressed about his work. He's a good man—too good to be wasted on a routine job like lubricant testing . . ."

"I'll be the judge of that," snapped Glassberg, his small eyes bright behind rimless spectacles.

"He said something about the motor he was using . . . Seems there was something queer about it," continued Colson. "I didn't pay much attention to the details; we've all got our troubles. I thought it might make him feel a bit better if I told him what hap-

pened to me this morning. For the past few days I've been working on an experimental U.H.F. rig. Just before lunch I switched it on for a short try out. It was short . . . The darn thing operated for less than five minutes and fell apart."

"Ceased to function," said Glassberg, irritably. "Why can't you say what you mean in a scientific manner?"

"Fell apart is the best description," persisted Colson. "I never saw a set blow like that before. The story raised a smile of sympathy from Bridger, and I went on to tell him that I'm going to build another, more durable rig the next time. You know how we techs talk when we get going about our specialities. Then the next thing I knew, I was lying on my back on the floor trying to prise his hands loose from my throat."

"The man is obviously unstable," said Glassberg. "I advised the Director against taking him back."

Colson eyed the Supervisor with ill concealed distaste—he was so right, but he seemed so pleased about it.

Bridger opened his eyes. The ceiling of the room was blank, but familiar. He at-

tempted to rise and found that his arms and legs were securely bound. He groaned as he realised that he was in the Psyche Ward on the twenty-fifth floor of the building. A door opened and soft footsteps approached. He feigned sleep, pressing his eyelids tightly together.

"You can't shut it out like that, Martin," said a deep, softly accented voice. "I hoped I had seen the last of you—it seems I'm not the Psyche I thought I was."

Bridger looked up into the broad, sallow features of Peinture. Ugly and bulbous as they were they conveyed a strange expression of understanding tenderness.

"Don't cover up, Doc," he said, tensely. "What happened this time? What did I do?"

"You don't remember?" said Peinture, his large mouth tightened at one corner. Bridger remembered his father using the same grimace. "That is good, in a way . . . At least you're out of it now. You tried to strangle Colson in the canteen."

"Pat?" said Bridger, disbelievingly. "Why in hell would I do a thing like that? I like the guy."

"Why indeed?" said Pein-

ture, with a movement of his hands. "That is what we have to find out. Feel like helping me?"

"Of course," said Bridger. "But how?"

"We did rather well with Narco Hypnosis before," said Peinture. "I'd like to try it again. If we can bring your motivation up to conscious level we should be able to straighten you out."

Somewhere in Bridger's mind something dark scurried for cover, leaving behind a feeling of resentment. I was supposed to be straightened out before, he thought. Run through incidents, analyse their implications; try to place manhole covers over the sewers of the mind and stop them pouring forth the corruption which takes over the conscious will. It had worked fine for a time, until the covers had weakened under the constant pressure.

"Anything you say, Doc," he said, listlessly. He watched disinterestedly as Peinture pressed home the needle of the shiny hypodermic. He felt the numbing effects of the drug flowing through his body with a flicker of pleasure.

Bridger sank deeper on the peaceful tide of the drug.

Peinture's voice sounded distant and hollow, drawing him back from the edge of oblivion, repeating:

"You are back at the time twenty minutes before the canteen incident . . ."

Automatically Bridger began to recount his experiences in the present tense.

"I look up at the wall clock. Thank heaven—it's ten to one. What a hell of a job for a man of my experience—testing the efficiency of experimental silicon lubricants. Suddenly I realise that something in the atmosphere of the room has changed. The hum of the test motor that has been grating on my nerves all morning is missing. I don't remember hearing any dying whine as it stopped. Strange . . . it couldn't just cut out and halt as abruptly as that.

"I walk over and pull out the power fuse—nothing wrong there. I replace it. Perhaps the mains have gone dead. I test, but the supply is O.K. The fault must lie in the motor itself. I put my left hand on the main shaft which projects from the side of the motor and lean over to check the connection of the power lead. No fault there. I straighten up and move a pace

backwards, looking at the motor.

"Then it hits me that the needle of the revolution counter is way over, as if the motor were still working. I look at my left hand, and then more closely at the shaft. It is, in fact, in motion, although the stroboscopic effect makes the revolution difficult to detect. I switch off the power, but the reading on the dial remains constant and there is still no sound.

"This set of anomalies gives my mind such a wrench that I wonder if I'm beginning to crack up again. I just stand there watching the motor . . . What am I to do? If I call Glassberg he won't believe me—hell! I wouldn't believe it myself if I couldn't see it. He'll think I'm going round the bend again—that will make the fat slob happy.

"Then suddenly, like a soundproof door opening, the hum of the motor fills the room. It descends in pitch swiftly and ceases, as it normally does when the power is shut off. I jerk the switch on and it begins to pick up speed again. I switch off . . . I still can't take my eyes off the motor, but this time it behaves normally.

"Is the whole thing an illusion, a trick played upon me by the unconscious? Such things have happened . . . especially to psychotics. I straighten my tie. My hands are shaky and clammy with perspiration. Better forget the whole thing, I tell myself.

"I walk out of the lab and take the elevator down to the canteen. The place is crowded as usual. Some day I'll get enough sense to go down for lunch before the rush. I join the slow moving line. Eventually I reach the hot-plate and start picking up food, piling it automatically on my tray.

"I get that 'people-are-looking-at-me' feeling. That tall girl over there—what's she laughing at? Snap out of it, Bridger, or you'll be back in the laughing academy! I sit down at an unoccupied table and sort out my plates. I find that there are two portions of soup, and no dessert . . . But I'm not going back to change them. I start to eat. The food tastes like nothing. Somebody sits opposite—it's Pat Colson, who works in Electronics, the next lab to mine.

"Hello there, Martin," he says. "Mind if I join you?" I attempt a smile. Colson is a good joe, one of the few

people who treat me as a normal human being, instead of being transparently jovial or visibly uncomfortable like the rest. This is my chance to unload the story of the motor—I put it to him as a hypothetical case, of course. Anything else would be asking for trouble, even with him. He doesn't seem impressed.

"You think that guy would have trouble?" he says. "You remember that U.H.F. rig I told you about? I thought I'd got the whole thing assembled just dandy, and before lunch I switched on the juice with an oscilloscope hooked in to test the wave form. The screened results were way off the beam, so I started to make some minor adjustments to the variables.

"That did it! After a couple of minutes the whole darn thing folded up. Several soldered connections came adrift and two of the tubes were loose in their holders—I hadn't bothered with retaining clips. Anyway, what's the difference? The rig wasn't up to the specifications the top brass want, that's for sure. I could have staked my reputation on that circuit. When I get back I shall have to try it again with different compon-

ents just to make sure, I suppose.'

"Colson's work bench is directly behind the wall against which my test motor is mounted. I wonder if...?"

"There's a blank here. The next thing I'm conscious of is lying on top of Colson with my hands at his throat. I've got to kill him. If I don't, something terrible is going to happen. I know it!"

Bridger strained at the bonds which held him to the couch.

"All right, Martin," said Peinture. He laid his hand gently on the man's arm. "It's all over—now relax for a few minutes." The powerful suggestion of the Psyche's voice lulled him to sleep almost instantly.

A few minutes later he awoke, feeling refreshed.

"Well? What do you think?" he asked Peinture, eagerly.

"Let's talk it over," said the Psyche, with a reassuring smile. "I have suspected for some time that the main source of your trouble is a direct hook-up which has been established between your unconscious mind and your motor mechanisms."

"Everyone's unconscious is capable of correlating data and drawing conclusions. You

know the old idea of the 'Psychic Twin.' These conclusions are normally pushed up to the conscious level in the form of intuitions or as biases towards a certain course of action. With you it works differently. Your unconscious makes decisions, and if the stimulus is sufficiently strong it is able to carry out its line of action without reference to your conscious mind, thus making you perform what would outwardly be regarded as irrational acts.

"The main fault in this procedure is, of course, that the unconscious, although it may be logical in its judgment of the situation, is uncivilised in its methods and moves directly towards its goal free of any inhibitions. Somewhere along the line the conversation with Colson triggered such a reaction. Perhaps you yourself will now be able to tell me the nature of that stimulus."

Working on Peinture's hypothesis, Bridger ran through the hypnotically revived memory data. The key relationship of ideas soon became obvious.

"I think I've got it, Doc," he said, hesitantly. "My unconscious may have been wrong in method, but it was

on the beam to some extent, as you say. A few months ago I read a paper by Vesskram, in which he suggested that somewhere in the U.H.F. range there may be a wave form which could induce extreme frequencies in a conductor such that the surface molecules were re-arranged to become perfectly fluid. Such an effect would virtually eliminate friction. The behaviour of my test motor and the coincidence that Colson was testing his U.H.F. experimental rig at the same time, suggest that he did, in fact, hit that particular frequency for a short time."

"Go on," said Peinture. "You seem to be on the right lines. How do you feel about the incident now?"

"A lot better," said Bridger, smiling. "My unconscious seems to have certain limitations from a scientific point of view. It must have immediately jumped to the conclusion that the entire building would collapse under the influence of the field generated by the rig. It took the only way that occurred to it to stop that happening."

"Not a very pleasant thought," said Peinture. "But it seems a reasonable assumption to me, under the circumstances. The steel framework of the building would surely collapse under the weight of its fifty stories if friction were removed?"

"At a snap judgment, yes . . ." said Bridger. "But think about it a little more. Remember Colson said that his rig stopped working . . . This was perfectly natural, since being in the centre of the field it was generating it had to withstand the greatest concentration. Don't you see? Although the phenomenon is interesting it could never be really dangerous, because it would always put itself out of action before it had time to affect exterior objects to any serious extent. For example: even the valves used in the rig are held in place by friction."

"Thanks for the reassurance, Martin," said Peinture. "I was beginning to develop mild claustrophobic tendencies myself at the thought . . . I don't think there's any more we can do today. I'm going to let you go home now. Go straight there and take it easy until you hear from me." He released the straps and Bridger rose from the couch.

"You mean I'm harmless now?" he said, wryly.

"I think so," said Peinture. "So long as you're not exposed to any violent emotional stimulus. That's why I say go straight home and stop there."

"How long for?" asked Bridger. "Today's little performance will probably mean I'm out for good this time—Glassburg will see to that."

"You'll have to trust me," said Peinture, escorting his patient out into the corridor. "In matters like this my opinion carries a certain amount of weight."

"Thanks, Doc," said Bridger. "I know you'll do your best."

He stepped into an elevator, which took him to the flat roof of the towering R.I. building. He walked slowly over to his parked copter and climbed aboard. The little ship swung into the air and headed for the city.

Perhaps Peinture would be able to square things for him—but this was the second time . . . If Research Incorporated fired him there would be little chance of another job. Bridger felt a

deep melancholy spreading darkly through his mind.

Suddenly his hands seemed to move of their own volition, jerking the controls violently. The copter shuddered protestingly as it was thrown into a steep turn and headed back in the direction of the R.I. building. Bridger sat rigid as the machine gathered speed.

He was less than a mile away when the towering structure of the building shivered as though shaken by some cosmic hand. He watched in frozen horror as it disintegrated and settled with deceptive slowness towards the ground. He fancied that he could hear the screams of the hundreds of human creatures who were crushed beneath the crumbling pile.

. . . And somewhere in his own mind the Psychic Twin spoke from the brink of madness:

"The great advantage of the Transistor over the Thermionic Valve is its far greater resistance to physical damage by shock or vibration."

Colson had built his second attempt well.

A winning entry in our article competition. We think there is much wrong with Mr. Puttick's theories. Can other readers do better than this?

The EXPANDING UNIVERSE

by B. G. PUTTICK

who wins a year's subscription to *AUTHENTIC*

MANY people have the mistaken notion that the so-called Expanding Universe is a proved fact. Far from it. It is only a theory based on observation of the famous red shift of the Fraunhofer lines in the galactic spectra. The theory was first suggested by Hubble in 1900 and has since been enlarged upon and made much of by Sir James Jeans and others. It has been given much publicity and is, therefore, well entrenched, but it has its opponents, and more should be heard about the arguments against it.

There are many scientists and others opposed to such an obvious and also apparently mad solution to a poser which has other and more realistic answers. Let me give you an idea of how ridiculous the Expanding Universe theory can be made to look.

The classic analogy used to demonstrate the theory is the toy balloon. It is painted with dots at equidistant points; the dots represent the galaxies. The act of inflating the balloon

represents the expansion. Take any dot as your own galaxy and all the others will seem to be receding from you. Take another look at the balloon before it gets too big and bursts. You will notice that all the dots remain the same relative distances apart and expand at the same speed, i.e., any dot can be the central one at any time of the expansion.

In the real universe, if the answer to the red shift is taken to be expansion we have the spectacle of the galaxies speeding away from us at speeds in direct proportion to their distance from us. At a distance of 10^9 light years, or approximately the depth of vision of the new 200-inch Hale telescope, they would be travelling away from us at half the speed of light. At this distance, mind you, in all directions, so that two galaxies at this distance on each side of us will be travelling at the speed of light in relation to each other. Does that seem sensible to you? If it

were true it would make our own galaxy the dead centre of the Universe. What a coincidence! Shades of Ptolemy!

On top of this the latest theories of the age of the Sun conflict so much with the age of the universe as predicted by the expansion theory that it amazes me that anybody would want anything else to do with it.

Several alternative theories to account for the red shift have been suggested. I am explaining one to you which may or may not be true. It ties in with cosmic rays, the cosmic ray angle being entirely my own original theory. Nobody has yet put forward a theory which adequately explains these particles and their origin; therefore, no theory can be said to be false until another theory is proven otherwise.

The universe is so vast and distances so tremendous that even light may change on such journeys. It would be strange if it reached us in the same condition as it left its source. The nature of light is still obscure, said to consist of photons, which are classed as electrons with no charge. Whatever light is, it must be matter of some kind, and every light beam reaching us

through the depths of space has had to come every mile of the way through all the other paths of light which are on their way from a source to infinity. This must have some effect of friction, however infinitesimal. Does it cause the light to lose some of its energy or to lose some of its momentum?

To say that the speed of light is not constant is enough to give some people apoplexy, but again it is only theory involved, so many people confuse theory with fact.

If we postulate, as we are entitled to, that the speed of light is not constant over great distances, then it leads us down many another path of speculation. Cosmic rays, for instance. Can cosmic rays have any connection with light? Start with photons. These I visualise as infinitely small particles, a great number of which go to make an electron. When they appear as light they are spaced apart. To make clear what I mean I give an example.

A spray of lead grains of about the consistency of castor sugar is hurled at a sheet of half inch plywood at slightly more than the speed of a bullet. On contact it won't penetrate but only coat itself

on the surface. Change the same amount of lead into bullets and fire them at the screen and they will penetrate.

Thus I see the following sequence of events taking place. Light matter is projected from the stars into space at the speed of 186,000 miles a second. During its tremendous journey through space it loses momentum, just enough at first to cause the red shift when the light is observed. At a certain interval of time and distance after this it has lost so much momentum that it ceases to have the properties of light; the photons have coalesced into the bigger, more penetrating electrons, which we call cosmic rays. Even with the loss of a few thousand miles a second they still have a tremendous speed for such particles. Note that the calculated speed of cosmic rays is just below light speed.

Cosmic rays are known to arrive at the Earth's surface from all directions in equal density. Only one thing has been observed in all directions—stars. Therefore, from this reasoning these particles must originate from stars. Yet there is no discernible increase of them from our own sun, which is, compara-

tively speaking, next door to us compared to even the nearest star. Nor has any increase been observed from the more crowded parts of the home galaxy. It seems then that the course must be the great outside, the far distant nebulæ, perhaps those out of range of our telescopes. It could, perhaps, be said that the other galaxies are in some way different from our own—tending by their composition to the formation of cosmic rays. This seems, on the basis of common sense, most unlikely; also it is not encouraged by the known characteristics of the further nebulæ, which, as far as can be ascertained, are similar in all respects to our own.

There you have the theme of the theory. It could be enlarged upon and altered to some extent. To work out the mathematics of the effect of light upon light would be an interesting task. It is a theory which seems to fit; which doesn't necessarily make it the truth, but to me the Expanding Universe theory was based on incomplete data, and has outlived its usefulness, and should be dumped before it entangles and hamstrings better and more enlightening theories.

What would even a professor of Physics do without our Albert?

The Higher Mathematics

by M. C. WOODHOUSE

ALBERT stood in the little room behind the lecture theatre, watching the students file in and take their seats. He took a personal interest in the attendance sheet for every lecture given in the Department of Physics, and it gratified him to see that, this morning at any rate, the benches would be filled. He had worked for two hours before breakfast, making sure that today's demonstration would run without a hitch, and so he listened to the hum and chatter which preceded the Professor's entrance with a growing content.

The post of Chief Technical Assistant to the Physical Laboratory was one that carried grave responsibilities. For, just as a college at a University is run, not by the Master or the Senior Tutor, but by Alf, the Head Porter, so the smooth running of a Scientific

Department rests in the hands, not of the Professor or his assistants, but of men like Albert and his staff, down to the boy who washes the flasks and test tubes. Lecturers may come, and lecturers may go, but Albert stays on for ever.

The lecture was due to start at any moment. Nine o'clock, said the notice on the board outside, and it was nearly ten past now. The daily battle to see which would arrive the later, the lecturer or the last ten of his audience, would soon be decided, and Albert could retire to the laboratory until the end of the lecture.

The door at the far end of the room swung open, and the Professor of Physics came in. The front rows of the audience, containing the keener members of his own class, together with those senior members of other departments who had been in-

vited to attend his lecture, turned from the study of the apparatus that filled nearly all of the rostrum, towering high on either side with banks of dials and cathode-ray tubes, to greet his entrance. The white wall of daily newspapers that hid the back rows fluttered in unison and dropped momentarily, to be lifted again more discreetly.

Albert quitted his post, and the lecture began.

"This morning," said the Professor, apparently addressing the projector in the centre of the audience, eight rows back, "I am going to demonstrate an impossible experiment to you."

If he had hoped to get a reaction from his listeners, he was disappointed. A few polite smiles from those nearest to him were all that greeted his opening statement. He continued:

"It concerns a branch of applied mathematics with which you are all familiar to a greater or lesser degree; a branch which has been given the name of Topology."

An earnest-looking student in the front row twisted a strip of mauve blotting paper into the form of a Moebius band, in an absent-minded fashion.

The remainder of the audience was by now beginning to detect a pleased ring in his voice, and a number of those in the centre rows put down their crosswords and prepared to listen with more or less attention.

"As you see," he went on, "the demonstration apparatus is fairly complex. On my right"—he waved in the direction of an assembly of wires and enamelled boxes—"you will see the power supply to a pair of plates, one of which is imbedded in the floor directly in front of me, and the other in the ceiling above."

He pointed with a piece of chalk, and about half of the audience followed the gesture. The plates were about three feet square, made of copper, and slightly hollowed towards their centres.

"When the power supply is switched on, there is formed between the plates, as you can readily imagine, an electrical field of no little strength."

Here, a number of the occupants of the back rows put down their papers, too. The possibility of electrocution may have entered their heads. In any case, the old boy sounded more promising than usual. The Professor crossed to the blackboard.

"Let us, for the moment, reconsider some of the theory that I have endeavoured to put before you during the course of my last two lectures. We have seen that the evidence obtained from counting the number of visible stars suggests that the universe, or space, as it is popularly termed, possesses a negative curvature, rather as the back of a saddle is curved. I shall not bother to run over the mathematical derivation of this finding again, since those of you who were here last time will, I hope, have followed the argument quite easily.

"We also saw that, as a result of this negative curvature, the volume of space within a given radius from any point of reference is greater than would be the case if the space were uncurved."

Shifting his attention from the projector, the Professor perceived a glazed appearance about the eyes to left and to right. It was, he supposed, possible that some of his pupils had not taken the trouble to read the textbooks that he had recommended for study during the term. Should he repeat his explanation for the benefit of the glassy-eyed, or assume that all was well and proceed to the next point?

He compromised.

"I will ask you to accept, then, that if the space in a given region is negatively curved, then the real volume of that space will be larger than its apparent volume. Conversely, if the space is positively curved, then its real volume will be less than it appears to be."

Perhaps a little joke might establish *rapport* with his audience?

"If you buy a pint bottle of beer, you want to specify that the space inside the bottle is negatively curved, not positively."

It fell flatter than a two-dimensional pancake. He hurried on.

"It follows, then, that if we could arrange for the space within a container to possess an *infinite* negative curvature, then the real volume of that container would necessarily be infinite. This, ladies and gentlemen, is precisely what I have done, and what I hope to demonstrate to you this morning."

The scales could practically be heard falling from the eyes of the occupants of all the rows, front, middle, and back. The nervous student with the Moebius blotting paper tore it

into small pieces, littering the floor.

"To return, then, to our apparatus. I have explained that the portion on the right is devoted to the supply of power to the plates, between which there is formed an electrical field. On the left, you will see three small parabolic reflectors, all of which are focused on the same spot, about three feet from floor level and in the field between the plates. I will not bore you with the details of the construction of the apparatus which feeds energy to these reflectors. It is enough to say that, when they are all focused on this spot, the combined effect of the electrical field forces and the output from the reflectors is so to rearrange the lines of stress within the region as to render the space it contains infinitely curved in a negative sense. The implications of this I have already explained to you. Are there any questions so far?"

The earnest student rose.

"Do you mean to say, then, Sir, that you propose to create an apparently small region whose real volume is in fact infinite?"

"You grasp my meaning admirably."

"I don't believe it."

"Naturally, my young friend, you don't believe it. Nevertheless, I hope to prove to you that it is true."

"Get on with it, then," said an unidentifiable voice from the back of the hall. This was followed by a certain amount of stamping of feet and banging of books on benches.

The Professor switched on the right hand collection of apparatus. Carefully avoiding the copper plate in the floor, he crossed to the other side of the room and adjusted a number of dials, then turned to face the audience.

"Are we ready, then?"

Opinion in the room was divided. Hardly anyone thought that the Professor was actually going to get the result he claimed. Some, however, couldn't see why he should bother to give a demonstration if he thought he wasn't going to get it. A few had a mental picture of his pouring a never-ending stream of light ale into or out of a region in space. Most were slightly apprehensive.

The Professor depressed three switches in rapid succession. Nothing whatever happened.

After about ten seconds,

the unidentifiable voice spoke again. "Good stuff," it said.

The Professor stepped forward and addressed himself to the voice.

"Just what did you expect to happen?" he enquired. "Flashes of green lightning, no doubt, or a weird violet glow? How do you think a region of negatively curved space manifests itself? You cannot see the field around a magnet, yet it is there just the same. However, if one of you will be so kind as to switch on the projector, perhaps you may see something, since light rays will be distorted in passing through the region."

After a moment, the projector came on. The beam of light shone on the wall behind the Professor's region of curved space, and in the centre of the square of light appeared a vague silhouette, shapeless, refractory, like the shadow of the heat ripples above a brazier.

The Professor picked up a piece of chalk and lobbed it towards the copper plate in the floor. It travelled in a high curve, fell towards the plate, and vanished about three feet above floor level.

There was a short silence. Then the voice from the back

of the hall said: "Good stuff," again, but this time with quite a different tone to the statement.

The Professor picked up the blackboard eraser and threw that, too. Three feet from the floor, it disappeared. A box of matches and a handkerchief, rolled into a ball, followed.

In the middle of the hall, a student stood up. His comment was brief and to the point.

"Roll up your sleeves."

"I beg your pardon?"

"I said, roll up your sleeves, please, sir. I just don't believe it, that's all. It's quite impossible."

"I can quite understand your confusion. I suppose, to the lay mind, this experiment must be quite impossible to understand. Perhaps you would care to come down before the class and test it for yourself?"

"Well, I . . ." Then, with a note of truculence: "Very well, then."

After some scuffling, the student reached the front of the room.

"May I have your name, please?"

"Layton."

"Very well, Mr. Layton. Perhaps you would select an

object with which to test the properties of space with infinite negative curvature. Since you are so confirmed a sceptic, your watch?"

The student considered for a while. Then, impatiently, he pulled off his watch, and, muttering something complimentary about the supposed properties of curved space, he tossed it towards the plate. Three feet from the floor, it vanished.

He looked at the Professor, who was standing with the smile of the successful conjurer on his face.

"Mass hypnosis," he said.

"Oh, come now, Mr. Layton. Surely you don't think I have come here to demonstrate a new version of the Indian rope trick?"

He shouldn't have mentioned it. The student's action was swift and startling. He took a short run, as though along a springboard at a swimming pool, launched himself into the air in a neat jack-knife, and dived headfirst into nothingness. Those who saw him go observed that he did so from the tips of his fingers to the soles of his feet. It was the cleanest dive that had ever been witnessed in the lecture theatre. Straight into

infinity, without a splash, and fully clothed, too.

Sitting in the laboratory office, Albert sipped his cup of tea and listened with approval to the noise coming from the theatre. A noisy lecture was usually a good one.

That meant that his work on the Professor's apparatus was being justified. Not that he knew what it was all for: the Professor had been much too secretive about it. But perhaps he would get a private word of congratulation after the lecture was over, just to show that the Professor appreciated that the work of the Department depended on the workshop and laboratory staff.

And if there should be a hitch, which was most unlikely, then Albert would appear at the door like a Slave of the Lamp, to get things under control again.

He smiled, and took another sip of tea.

It was, perhaps, just as well that he was not in the hall to watch what was going on there, or he would have been rudely surprised.

The Professor and two students had tied a number of scarves together to form a

rope, and were paying it out, hand over hand, into a patch of negatively curved space three feet from the floor. Opinion as to the value of this manœuvre was once again divided, some maintaining that so long as he stayed near the entrance, he might be able to get hold of the knotted scarves and draw himself out again, while others, among them the earnest student with the Moebius band, held there was no such thing as a specific entrance to infinity, and that, therefore, they were wasting their time.

The truth of this argument was not disputed, but, on pulling on the end of the rope, the portion which had just vanished reappeared again, so it was felt that there was some hope.

There are some people who must prove their point, however, and the earnest student was one of them. He proved this most successfully by crawling under the infinity patch and standing up rather suddenly, the suddenness being due to the considerable charge on the copper plate in the floor. They didn't quite catch his feet as he disappeared.

One of the more irreverent of the bystanders wrote:

"Score—Two - nil" on the board, and the infinity fishermen paid out some more rope. If there are some people who must always prove their point, there are others who will not accept a point even when it has been proved.

A Physiologist wanted to know whether the air in an infinite volume of negatively curved space would support life.

"There isn't any air," said the Professor.

The fishermen stopped paying out scarves, discouraged.

"If there isn't any air," said the Physiologist, "then there must be a vacuum. And if there's a vacuum, why isn't the air from this room being sucked in?"

"Must be self-sealing, like an aeroplane petrol tank," said an Applied Physicist.

"I think," said the Professor, "that you are all confusing the practical with the theoretical issues. This is not a case of crawling through a manhole into infinity, you know. The volume of the region in question is only theoretically infinite. If it were practically so, there would be no room for us on the outside of it, would there?"

He looked around with the

air of one who has proved his case beyond argument. The Physiologist, however, remained unsatisfied.

"That takes a load off my mind, I must say. You mean those two have only theoretically vanished into a mathematical infinity? Perhaps you'd better let down a whole string of mathematical equations and see if they can climb back up that. I just don't know what we'd do without you Physicists."

"There is no need to be offensive," said the Professor. "I shall go down—I mean in—myself, and try the air. You shall tie the scarves round my waist and let me explore, and if I pull on the end of the line you can haul me in."

This proposal was hailed with approval, a number of those present expressing a wish to go instead, out of curiosity. The end of the rope of scarves was tied to the Professor's belt, and a chair was brought and placed next to the copper plate. The Professor mounted, held his nose with one hand, and jumped, while the Physiologist and four others held the other end of the rope.

It broke at one of the knots.
Score—three - nil.

"You know, he was right in a way," said the Applied Physicist. "In a sense, they *have* only theoretically vanished into a mathematical infinity, because the concept of infinite volume, as applied to that particular region, refers only to the three-dimensional framework we are using at the moment."

"Oh, I see. Fourth-dimensional stuff, eh?" said the Physiologist. "You mean they might have plenty of air after all, only in another set of dimensions, a sort of parallel space-time continuum? It's a thought, I suppose. Is it worth betting on?"

"I think so. Look, I'll tell you what we'll do. We'll only use one scarf, a long one, and tie one end to a bench. Then, one of us will take hold of it and slide; not jump, into that patch, and the others can follow, holding onto each other all the time, so that we never lose contact with the place we came in. That way, we'll have a very long human chain, and so long as nobody lets go, we'll all be safe, and all of us will see what goes on inside there. Myself, I'm pretty curious about what they found."

So were they all.

Albert, hearing the sound of voices dying away into silence, and the scrape of chairs on the floor, put down his third cup of tea. The lecture must have about finished by now, and the Professor would probably need him to dismantle the apparatus and clear it out of the room.

He went to the door of the lecture theatre, and listened. Not a sound. He pushed it open a fraction, and peered round it. Not a person in the room, not even the Professor.

He pushed the door right open and went in. The exit doors were still shut. Books lay on all the benches. He walked over to the blackboard, and stopped in front of the apparatus.

On the floor, one end tied to a bench, was a scarf. It

sloped up into the air, stretched taut, as though it were hanging over a cliff edge, supporting a weight. But there was no edge visible, and the other end of the scarf was missing. It shifted slightly, and stretched a little more.

"Blimey," said Albert.

He untied the end from the bench. Like lightning, the scarf whipped across the floor and into the air, and vanished.

"Liver," said Albert. "Must be."

They'd left the apparatus switched on, wherever they'd gone. He went over and switched it off. First the power supply to the right, then the three reflectors on the left.

"Impractical, that's what," said Albert. "No telling what they'd do to themselves if it wasn't for me, is there?"

STRANGER IN TIME

by S. Gordon

is next month's feature novel. Other stories include *The Mutilants* by R. C. Wingfield, *Robot's Gambit* by Richard Wilson, *The Bridge* by Len Shaw, and *Tryst* by W. B. Johnson. Supporting non-fiction features include *March of Science*, *Logic Is fun*, *Planet Farms*, *Fanzine and Book Reviews*.

AUTHENTIC — A MONTHLY MUST!

ROBOTS—they're making them almost human

by PAT O'HARA

THE latest in robots can play tennis, light a cigarette, mow the lawn and water the garden. If needed this unique machine, called Gog, can remove a lady's wrap and help her to put it on again.

For years now men have been building better and better robots. Amongst the most recent creations are the members of a three-piece band in an Antwerp cafe. This robot orchestra took six years to design and build. Today, Winking, Blinking and Nod play the guitar, drums and saxophone and turn out the latest tunes for their guests. Blinking even drinks beer and — croons!

From the novelist's dreams and the inventiveness of man, the robot really developed between the wars. Although for hundreds of years men have been attempting to make outstanding robots, it was only after World War One

that the almost human creations appeared.

Although there have been many robots in the course of modern achievement, the grimdest and most macabre was that produced by a French Canadian scientist. It was not the mechanical devices or tricks of this robot that made it macabre. It represented its creator's son who had been killed in the war.

This wonderful machine could add figures, draw delightful pictures, play tunes upon musical instruments or even take a hand at cards.

Back in 1934 another of these mechanical geniuses was built by a young American scientist. This "man" surpassed all others before him, by quite literally behaving as a human. The robot had likes and dislikes. To all outward appearances it could think and even choose. Even more amazing was the fact that if

you pulled its hair the robot flinched with pain.

A few years before the outbreak of World War Two, a German engineer invented "Rupert." This robot was not only handsome and smartly dressed, but was capable of the most natural actions.

By 1937, robots that walked and talked were not new, but one that could bake a cake and eat it, or drive a car, certainly was. Rupert enjoyed a drink too, and even proved his versatility by demonstrating machines.

One of the great attractions of the 1939 New York Fair was an amazing robot called "Elektro." Billed as the world's latest and greatest mechanical man, it was made of some 900 parts. He worked by a series of complicated electrical relays and an "electric eye."

Aluminium skinned "Elektro" weighed some 260 pounds and managed to perform tricks never attempted before by a robot. The seven-foot marvel could count up to ten on his fingers; could call out "red" and "green" when these colours were flashed before

his eyes. He even flexed his knees as he walked, and could smoke a cigarette.

A short time ago a London exhibition was thrilled by the antics of "Godfrey," a robot whose electronic brain enabled him to move and speak almost like a human.

Today the most interesting gadgets are not those fashioned in the likeness of a man. In the past there was a concentration by inventors on producing almost human robots; today scientists are devising ingenious machines, each of which does a specific task. There's the Isophone, which takes telephone messages in your absence, or the great mechanical brain that can calculate rapidly and accurately.

Perhaps it should be added that "Gog," who plays tennis and is useful in the garden, also performs other essential tasks, like helping scientists to handle radioactive materials which are dangerous to human beings.

Thus, the robots of science fiction are not entirely without factual basis.

*Different things have different values in different places—
and for different people.*

THE MERCHANTS

by D. R. DAVIES

PINPOINTED against the purply-blue sky Ned Bradley could see the tiny points of incandescence which were the braking jets of the approaching spaceship. Impatiently he jogged the controls of the little hover-plane, already travelling all out, as his eyes anxiously swept the ground below him.

Away to the north was a tiny cloud of dust. Quickly he scanned the map, then relaxed. That would be his convoy. Miles of heavy tankers lumbering at the limit of their speed towards the ship's predicted landing point. Far to the east was another dust cloud; that would be Gulsworth's lot. He stiffened slightly as a third white puff caught his eye, rather nearer, if anything, than the other two. Who the devil was that? Surely Gulsworth and himself were the only two left in this hemisphere. It had been over six months now since the last trading ship had called at Earth, and one by one the

others had dropped out. Six months of anxious waiting with colossal overheads; why, the radar chain alone—With an effort he jerked his mind away from that tack. The new Anti-Recessional Act treated bankruptcy as treason. It took a brave man to go over the edge as he had done. Or a fool. If this ship hadn't turned up— Abruptly he put the 'plane into a steep dive, down to where the three roads intersected and continued as one broad highway. He flew along it for a while, radioing back information to his convoy.

When he reached it, the ship had swollen to a huge, inert mass. He could have landed on it, if it hadn't been for the thermal agitation set up by the heated hull. Instead he put the 'plane down as near as he could. Gulsworth was already there. Tall, immaculate, and smoothly efficient, he greeted Bradley with a controlled friendliness. Bradley ignored the needle of irritation generated inside him

by the other's serene superiority. Gulsworth was just a factor in the problem, and he had to keep him like that. As they talked, a third 'plane appeared. It bumped noticeably before the engine cut and a plump figure bounced out.

Bulmont! So he was still in the running. Despite himself, Bradley felt a certain admiration for the fellow. Muddling along with bad organisation and out of date equipment, he had lasted longer than most. Bradley thought of the third convoy he had seen. If that was Bulmont's they'd never make it in time, not with the kind of stuff he could afford. Unless, of course, he had found a new backer. Bradley looked at him thoughtfully.

Uncertain of his reception, Bulmont advanced with a deprecatory half-grin. He waved an absurdly small hand towards the ship.

"I may as well tell you that I haven't got enough to fill this one. Maybe, if I land the contract, one of you fellers would like to chip in. That is . . ."

A genius for saying the wrong thing, thought Bradley as the voice tailed off. Gulsworth regarded the newcomer

coldly through a blue haze of cigarette smoke.

"You haven't got it yet, Bulmont."

The voice gave nothing away. It was just a statement of fact, but Bulmont looked like a reprimanded child. Bradley felt uneasy.

"There's time yet," he said.

As though in contradiction, the outer airlock of the ship opened, and an insulated ladder slowly unfolded to the ground.

The cabin was an iridescent green, with fittings in different shades of the same colour. Coolness and an aqueous tranquility. Only the Earth-type chairs struck an incongruous note. The two Clotids remained silent as the men made their way towards the chairs. Pinkish eyes observed them with detachment as they settled themselves. It was considered ill-mannered to speak until one was comfortable and relaxed, able to give full attention to one's words. Bulmont had never been very good at it. Try as he would, his rotund frame somehow betrayed its eagerness to bounce out of relaxation into action.

The larger Clotid spoke first.

"You are welcome aboard our ship, Terrestrians."

The voice was thin and fluting, meticulous in detail of enunciation, and strangely at variance with the large frame. Conversation began; ethics and art, the interdependability of intelligence and matter, the essential unity of all forms of life. Gulsworth was in his element. Smoothly and effortlessly he guided the conversation, bridging difficult gaps, skirting alien conceptions, and gradually working nearer and nearer to the inevitable point. Bradley risked little beyond the conventional, pinning his faith in the ability of his convoy to get there first. That still remained the most important factor.

Bulmont, anxiously inarticulate, tried to make out by radiating tolerant good humour. Time and again he tried to make a contribution to the discussion, only to be forestalled by Gulsworth's suavity, or Bradley's quick recognition of an opportunity for a stock phrase. For all that, Bradley was uncomfortably aware that Bulmont was getting more than his fair share of attention, particularly from the smaller Clotid. It was impossible to tell what they were

thinking; maybe it was just curiosity.

Suddenly and unexpectedly Bulmont cracked. His face, bereft of its smile, paled suddenly, then flushed again as he came to his feet.

"Look, Clotids!" His voice was hoarse and squeaky. "I don't understand it. All this talk. I'm just plain human and dumb!"

He fumbled with his briefcase, fingers podgily inexpert. "Take a look at this, and let me get out of here! Here it is. Qualities, analysis and everything."

He produced a sheaf of papers, then looked around, isolated by his temerity. Chokingly he inserted a finger under his collar.

"Sorry, but there it is. Can't help my reactions."

He was floundering now, waving his small hands agitatedly as he made for the door. The Clotids remained immobile, their withdrawal obvious. Or was it? Bradley thought quickly, then rose, placed his papers carefully at the side of Bulmont's, bowed and left. That was the smartest thing to do, back both horses.

Outside, Bulmont turned to him. He was trembling violently, eruptively, beneath his

blubber. Tears trickled down his mauve cheeks. A fat man weeping. Nervous breakdown.

"I... I wasn't trying to steal a march on you fellers."

Bradley turned away in disgust and embarrassment.

"Sure! Sure!" he muttered, and made his way to the hoverplane. People like Bulmont had no business in this racket. If they couldn't take it, why the devil didn't they get out? Impatiently he clicked the visiphone switch which put him in touch with the convoy. He was worried about that intersection and the information he got did little to reassure him.

"Look," he said, "I want you to close the convoy up tight. Get to the intersection first, and pull well over, so that the others will have to drop in behind you."

"Who says we'll get there first?" asked the face on the screen. "If we close up we'll lose speed. Better leave this end to us."

The screen went blank. The trouble was that those people didn't know what was at stake. It was just another operation to them. Still, this was no time for a pep talk; they had their hands full as it was; no sense in panicking them.

Night had fallen when Bradley heard the tapping on the plane's perspex.

"Care for a chat?" Gulsworth's voice was calm and sardonic, but beneath it Bradley caught a note of urgency. They moved away from the 'plane, Gulsworth walking deliberately, formulating his thoughts.

"I can't explain how, but I think Bulmont's swung it."

"Are you sure?"

"No. You know these Clotids—they'll never give anything away until the last minute. It's just a feeling I've got."

"There's nothing we can do about it."

Gulsworth was silent for a while.

"Bulmont's finished. If it's not this time, it'll be next time. I want to make a deal."

Bradley kicked at a small pebble. He said nothing.

"I want a fifty-fifty split, irrespective of who fills her up."

They had turned back now. Could he take a fifty-fifty split? If he lost everything, he was finished. On the other hand . . .

"I'll think it over. Let you know before the convoys get here."

Gulsworth laid a hand on his arm, forcing him to turn.

"I want to know now."

Bradley knew he did. It was no good putting it off because it left a bad taste in the mouth. With one hand on the ladder, he turned his head.

"O.K."

Gulsworth went away without answering.

About midnight the convoy called on the visiphone. The face on the screen looked drawn, defeated. They had been going a long time.

"Coming up to the crossing now."

"Any sign of the others?"

"Sure. Can see their lights up ahead." The eyes suddenly focused with interest. Tiredness fell away from the face like a mask. "That's funny, they're stopped. Hold it, there's something going on up there. Cripes, what a pile-up! Looks like half a dozen tankers!"

Bradley tapped anxiously and futilely at the screen.

"Can you get through, man?"

"Sure. We can get through. But d'you know what? *We're the only ones that can!* The other two roads are blocked.

One of those guys must have taken the wrong turning."

"Yeah," said Bradley, slowly, as he switched off, "I wonder which?"

As Bradley stood watching his tankers fill up the ship, Bulmont came up to him. The early morning sun detailed his features with a sharp clarity. His hair was disordered, and his face a dead white, except for the mottled patches on his cheeks, like paint. His eyes were curiously remote, impersonal, and his discarded tie trailed from his jacket pocket.

"Looks like you've made it, Bradley." The voice had gone up half an octave, and the smile looked indecent.

"It's the luck of the game."

"Maybe. But you've got to stand a long way back to see it. I'm finished, anyway. In a way I'm glad; it's been a long time coming."

There being nothing left to say, he wandered off aimlessly among the trucks, like a lost child.

It only remained to transfer the Clotid's treasures to the armoured vehicles. That took some time, for each article had to be separately handled and listed. Although he had

seen them before, Bradley was soon lost in admiration of the exquisite craftsmanship. Delicate golden caskets and ornaments, brilliants cut with a precision never known upon Earth until the coming of the Clotids. A fabulous fortune, half of which was his. Would it last until the next ship called, he wondered?

Clear of the Earth's atmosphere the Clotids sat before a bottle of colourless liquid in the green cabin, which had been restored to its aesthetic proportions by the removal of the chairs.

"I'm not going to like it," said the smaller.

The other toyed for a moment with some enormous diamonds, idly dropping them into a golden chalice.

"I didn't at first, but one gets used to it. Imagine going back with over a million

gallons of water in the hold. Concentrated hydrogen and oxygen, the source of life and all energy, and they give it away for metal and crystallised carbon, as common as dirt in the Galaxy. And then it's quick. One more trip to Creton for a consignment of these cheap trade goods"— impatiently he swept the chalice from the table—"and one more cargo of pure Earth water, and I can retire to a decent life."

"The ship will be yours then, my boy. You'll soon overcome your moral scruples when you see your credits mounting. There's just one thing. Be very careful how you handle the natives. Keep the conversation on a high moral level, and never, no matter how much you are tempted, never laugh at them. Above all, avoid affronting their dignity; they have . . . er . . . rather queer ideas."

Space Travel and the Law

by PETER SUMMERS

ALL enterprises that involve many people and their property require, in the long run, special legislation to take care of the possibility of new circumstantial disputes. Space travel, man's greatest enterprise, will be no exception.

Already lawyers are giving thought to the problems that will arise when spaceships soar above the Earth and humans land on and colonise other planets. True, nothing concrete is being done about it yet, but we can be sure that when the time comes for Parliament to discuss space legislation quite a few lawyers will not approach the topic in complete ignorance.

Of course, the biggest problem is finding an answer to the question: Who owns space? Remember that space just goes on and on, and that if you look straight up—whatever "straight" means—above your house there is no limit to the line of sight. Your two-dimensional ownership is clearly enough defined; it is

that area of the Earth's surface that is designated at the Land Registry as having become yours by virtue of a legal transaction; it has measurable boundaries. True, there are often disputes about the precise placement of these boundaries, but the boundaries are there somewhere. It is just a matter of finding them. This costs quite a lot of money and takes a fair amount of time, yet the legislation covering it is perfectly adequate.

Your three dimensional ownership is also legally defined—it is virtually nonexistent! Here we have an example of changing legislation with changing conditions, a forerunner of what will have to be done when space travel becomes a reality. In ancient law a man who bought an area of land was deemed also to be the owner of all the space above that area; he was looked upon as the owner of a *volume* delineated by erecting imaginary planes upwards

from the boundaries of his land.

But with the development of aircraft it became essential for the good of the community as a whole, and later for the good of the world as a whole, that private ownership of air space should cease. Otherwise, the airline people would have had to pay royalties to everyone over whose land they flew 'planes. This kind of thing became expensive enough for the railway companies, and if it had applied to airlines it is pretty certain that we should never have seen the enormous development in aircraft that has characterised the last century.

The law was changed so that the ownership of the air over land was vested in the State, and international law allowed each State to retain ownership in the air above it, making provisions for concessions to peaceful foreign aircraft. That is the way the law is today. By letter, it embraces the region above the Earth that is terminated by the end of the atmosphere. No further.

Now, "the end of the

atmosphere" is not an easy thing to define. Earth's air blanket does not come to a sudden stop, but peters out gradually, getting thinner and thinner until so few molecules are present that their detection is either extremely difficult or impossible. Until recently this did not matter, for aircraft ceilings were well below the vaguely defined region that could be called the outer limits of the atmosphere. But now that vessels such as the "Skyrocket" are being developed—which need no air—it is quite possible that new legislation will be required even before true spaceships are launched.

The legal pundits may, at the same time, consider future developments and make the necessary alterations to embrace space travel proper. With very little doubt, this will involve a great deal of argument and will take a considerable time, but at least the contestants are States, not individuals!

An article in the *International Law Quarterly* put forward the suggestion that State ownership should simply be

extended to include all space above the State. This, certainly, is an easy way out—but is it a way out? The learned barrister who put forward the idea may have been better acquainted with law than with physics—as one would expect—and did not seem to realise that an imaginary column erected from an area of Earth's surface constantly sweeps through space as the Earth rotates. Thus, a spaceship in a position above its home State which maintained a stationary position with respect to bodies other than the Earth, would pass into the imaginary columns of other States as the Earth revolved. In effect, to stay in the column belonging to its own State, the spaceship would have to keep on moving, upwards in a close spiral, going round and round with the Earth and getting farther away all the time. This is completely ludicrous and unworkable.

Much better is an idea put forward by Oscar Schachter in an article reproduced in the *Journal of the British Interplanetary Society* from the

Symposium on Space Travel held at the Hayden Planetarium, New York. Schachter suggests that we should "limit the outer boundary of a state's territory as presently under international law, to the region known as the air space and not beyond." In other words, we somehow arrive at an acceptable definition of "air space" and make all the space above it open to anyone.

Like the high seas beyond territorial waters, this space would then be subject to international laws which would maintain order in the void. This way, it would not be so much a matter of changing existing laws—to which everyone has got used by now—as bringing new laws into force. Though there would still undoubtedly be a lot of argument about these new laws, there would probably be less than if the old laws had to be changed.

Of course, it may well be that hot argument will rage over the question whether there should be changes in the old law! Whichever way you look at it, it will not be easy.

When the planets are col-

onised there will be little need for new laws of territorial nature. The laws applying to Earth will apply to the planets, so that each planet comes to have so many miles—expressed as concentration of gases, perhaps—of "territorial space." The Moon is another matter. It has no atmosphere to serve as a natural limit on territorial space. Probably, there will be an agreement reached, whereby the Moon enjoys territorial space equivalent to what it would have if it had an atmosphere—a topic for more argument! Perhaps the best solution of all for this problem of territorial space would be to take the Earth as standard, and give all celestial bodies a mileage equal to Earth's territorial space. Then, if asteroids were colonised, we should find "worlds" which have more territorial space than land.

men to a new land has annexed that land as part of its property. Later conflicts may have made the land change hands once or twice, but that is not a *legal* process. Will the same principle apply where celestial bodies are involved?

In actuality, the answer will very probably be affirmative, for that is the way that military minds work, and it will be militarists who first land on other worlds. Nevertheless there will be large sections of Earth's population who will feel that such a system is outdated. The old method of "catch as catch can" will no longer be equitable. It will be felt that the resources of the Moon, Venus, Mars and so on, should be made available to the whole of Earth's peoples, not just to those who happen to have been first in the race to make a spaceship. This is an enlightened view and presages an enlightened era. But, of course, in a truly enlightened era there would be no militarists. Until the need, or apparent need, for national armament in all its aspects

Next in importance of new problems will be the question of ownership of celestial bodies. On Earth the tacit agreement has been a matter of "first find, first have." Whichever nation has sent

has disappeared it is hardly likely that common sense will be the keynote of interplanetary law.

Meantime, we must assume that whoever gets to, say, the Moon first will consider themselves to own it. Conceivably, they will lease out parts of it to other States under certain conditions. Conceivably, too, other States might go to war with the first one in order to gain control of our satellite. It is probably too much to expect for States to stake out an area around their landing ground, leaving the rest for anyone else who can make the journey. Even then there would probably be conflict over the extent of staking out. Perhaps the one consolation about conflicts on the Moon is that man, with even his vilest weapons, cannot make the Moon any deader than it is!

But it is just possible that something like world peace and friendship will be in vogue when the first landings are about to be made. Under those conditions it may well be that international bodies will reach equitable agreement

about rights of ownership in the land of other planets. If the launching of the spaceships is also an international venture, as it may well have to be for reasons of economics, then the other planets may be owned and administered by an international body, which would execute its duties with the emphasis of making the other planets serve Earth in the best possible way.

If only the heads of States could be made to see this, then the launching of the first spaceship could herald the beginning of a new era in which the peoples of Earth live together as members of one species, rather than operating under the law of interspecific elimination, as in the jungle.

There can be little doubt in the minds of serious thinkers that, however strong one is for individual freedom and lack of State control, public, rather than private, ownership is the only method that will really work when man extends his domains beyond this Earth. The application of State control to terrestrial matters is still a subject for hot and

angry debate. It will not be less so when it has to be applied to other worlds. The successful steering of the legal situation to the point of maximum benefit, through the tangled web of intrigue, prejudice, power politics and sheer ignorance, will call for statesmanship of no mean order. Some people believe that Earth's present problems directly stem from the innate incapacity of the world's statesmen. If this is so, if the human mind is somehow unable to rise to the administrative heights required by even the relatively simple situation on Earth, how is it going to contend with all the complexities of interplanetary expansion? The answer to this is quite simple: It cannot so contend.

This answer is unpleasant and we tend to reject it, for it gives the future no hope beyond the hope of keeping

down conflict to the minimum rather than wiping it out altogether. In rejecting it, we must assume that our statesmen *are* capable of running the world, if only they are given the right conditions. It then becomes a question of providing statesmen of the future with the right conditions under which they can administer the planets. The only way of doing this that we know of at present is by uniting—by *not* seeking national independence and by *not* trying to retain it in the sense that all other nations are deemed potential enemies and, therefore, to be encouraged as little as possible.

Not only the law of the future, but all other roads, lead back to this same conclusion. Pride, prejudice and patriotism are misplaced in a world of intelligent people. Only when they have gone will the Earth be such.



FICTION

The anthologies of science fiction that come from Grayson & Grayson seem to be getting better and better, and we tend to wonder where the ceiling is! Their latest, **THE FIRST ASTOUNDING ANTHOLOGY** is well worth the 9s. 6d. purchase price—if you have not already got the American edition. It contains seven long stories, each of which originally appeared in the American magazine, *Astounding Science Fiction*, which many people believe to be the best or second best in that country. Without doubt these stories are all of uniformly high quality.

There is *Blowups Happen*, by Robert Heinlein, a story of what might happen to the minds of men entrusted with watching an atomic pile that could easily—blowup. You find that the men are liable to blow up, too. And there is *Hobbyist*, Eric Frank Rus-

sell's penetrating tale of what some men might call the Prime Cause. Murray Leinster is represented by *First Contact*, James H. Schmitz by *The Witches of Karres*, Theodore Sturgeon by *Thunder and Roses*, John Pierce by *Invariant*, and William Tenn by *Child's Play*. A fine collection. (Grayson's address is 16 Maddox Street, London, W.1.)

Eric Frank Russell's third major novel has now been published in Britain, by Museum Press (63 Old Brompton Road, London, S.W.7) at 9s. 6d. It is **SENTINELS FROM SPACE**. It lacks the pace and tension of *Sinister Barrier*, Russell's finest work, and it is very reminiscent of the van Vogt space-ranging style. But that is no criticism, just a description, for **SENTINELS FROM SPACE** is a good book by any standard. Set in the future, when Mars and Venus are not only colonised, but are striving

for independence in no uncertain manner, the story follows the efforts of one specially qualified man to put a stop to the conflict in the solar system. In places, these efforts are not very credible, but always they are intriguing—especially when they involve the mutants, twelve kinds of which have been developed in man's image.

The book has many facets, as Russell books usually do. Cunningly interwoven are the separate "messages" about mutants, about planetary colonial expansion, about the apparently immutable nature of man. Though this many-angled treatment tends to give a lower gripping-value than one-track stories, *SENITELS FROM SPACE* has a multi-dimensional quality lacking in *Sinister Barrier*. It is certainly a very recommendable book, and for serious collectors is absolutely essential.

That popular contributor to *Authentic*, Jon J. Deegan, has taken time travel as the theme of his latest novel (Hamiltons, 6s.), called *EXILES IN TIME*. Here, perhaps, is Deegan at his best. He seems to have outgrown the limitations imposed upon his style by his earlier "Old Growler" stories, and

to have entered upon the more comprehensive pattern of novel structure.

In *EXILES IN TIME*, he traces the adventures of a man and a woman whose insatiable curiosity about things in general lead them to embark on somewhat perilous journeys through the time-stream. You may remember that Deegan's two previous books, *Corridors of Time* and *Beyond the Fourth Door* (also from Hamiltons) introduced us to these characters. In this third of the series, Deegan has drawn them with greater precision and increased realism. As people of the future, they seem credible enough. And in this story they have all our sympathies and attention right from the start, when they decide to cross the door of time to when they get themselves in a fix "on the other side."

Well worth reading by all the many thousands who have enjoyed previous Deegan books.

Jonathan Burke is also a name not unknown to readers of *Authentic*. The theme of his latest novel, *TWILIGHT OF REASON* (Hamiltons, 6s.), is pandemic disease, the biggest and most virulent ever. He draws for us the crushing disappointment that comes to

humanity when, after years of hard struggling to effect the conquest of space, mankind must forego the triumph of launching the first spaceship and turn their backs on the Moon.

Behind it all is an old idea—a plague. The causative factor drops onto Earth from space; it is deadly and it multiplies with alarming rapidity, the way these things always do. But originality comes into the conception of the specific characters of the plague. This is no ordinary pestilence. This plague "did not so much

drive men out of their minds as steal their minds from them." So you have a world full of burning frustration and dribbling insanity—you can see that there are possibilities!

The most interesting thing, perhaps, is the credibility of this book. Burke leaves you with the feeling that, as the publishers say on their blurb, this is "a future that might be ours from tomorrow on." Like all Burke's other books, *TWILIGHT OF REASON* is eminently readable and highly recommendable.

NON-FICTION

Anyone who answered "No" to the question, "You've heard of Einstein?" would be considered to be somewhat out of this world. It may well be true that Einstein's is the most household name of any living man, in that people of all ranks, creeds and colours seem to have heard of him. Not long back a poll was carried out in America to test the general standard of "awareness." More than fifty per cent. of the people questioned by the poll did not know the name of the American President, yet only a tiny fraction had not heard of Einstein! It is surprising, there-

fore, that so few books are available about the man. The latest addition to this select company is *EINSTEIN*, by Antonina Vallentin, published by Weidenfeld and Nicholson (7 Cork Street, London, W.1) at 16s.

As a member of a small company it probably holds a high place, but as a biography in general terms it is something of a failure, especially when measured against the importance of the man who is its subject. The failure is caused by an apparent slovenliness, both in the writing and in the general plan of the book. The first may be due to innapro-

priate translation from the French by Moura Budberg, and the second may be due to the author and publishers not realising that a book of this nature is almost as much a reference book as one of the kind you just sit down and read. There is no index and there are no chapter headings. Thus it is impossible to find your way about the book unless you have a prodigious memory for just where your particular interest lies among the rambling passages that make up a biography.

However, if one can forget all this, and it is worth while trying to do so, there is much of very real interest in the book—the essential intriguing nature of the man shines through, in spite of the people who had to do with the making of the book. Working our way through the rather clumsy and at times heavily “purpleized” descriptions, we yet do not fail to perceive that, though here is an amazing man with amazing accomplishments, there seems nothing at all that one can point to as the cause.

Einstein was something of a dunce at school. He was all tied up with moral and religious and political ideas—

things often coming much later in life to most scientists—he could not even get himself a real scientific job, but had to spend his time vetting applications for patents. It was while he was doing this that he put forward his theories of relativity—together with four other papers on other subjects—in a rather obscure publication in 1905.

This was a remarkable series of papers for a man of any age, let alone one of twenty-six. One of them on molecular dimensions got him a university job; another on the quantum laws brought him the Nobel prize—eventually; a third put everybody right about Brownian movement; a fourth settled many things about inertia; the fifth was entitled “On the Electrodynamics of Bodies in Movement” and was *the* one.

From then on the story speeds up and becomes one of the most enthralling things this reviewer has read. You read it, too, in spite of the faults.

MATHEMATICS IN ACTION, by O. G. Sutton, F.R.S. (published by G. Bell, York House, Portugal Street, London, W.C.2, at 16s.) is the kind of book that many people must

have been waiting for. Mathematics is becoming such an integral part of all aspects of science and technology that it is no longer possible fully to understand what is going on without a fairly extensive knowledge of several branches of maths. Unfortunately, several years would be required to cover the complete theoretical (or "pure") background from which the practical ("applied") mathematics are derived, and only the youngest students can afford to spend so much time on what is, after all, an ancillary subject.

This is where MATHEMATICS IN ACTION comes in, for it is an exposition of the application of mathematics to various branches of applied science—ballistics, wave phenomena (radio, television, radar, etc.), flight, statistics and the weather. (The last is something of a concession to the author's speciality; he is Director of the Meteorological Office.)

Dr. Sutton has worked with distinction in each of these fields and, being a really expert mathematician, is able to present his subject with the minimum of difficulties. The book assumes an acquaintance with the rudiments of

calculus (for this, no better book is available than *Calculus Made Easy*, by Silvanus P. Thompson, F.R.S., Macmillan, St. Martin's Street, London. Price about 5s.) and begins with two chapters of a general nature dealing with what the mathematician has to do and what he does it with. The other five chapters are each devoted to a single subject and cover the mathematics which practical men apply to those subjects.

In places, obviously, the going is rather rough, and the reader must be prepared to put in a good deal of mental effort. But this is probably the simplest exposition available, and a lengthy appendix supplements the theoretical background. A series of problems with answers would have given the book even greater usefulness for the first year university students, for whom the book is also intended (the book is primarily meant for the layman) and it would be nice if this could be incorporated into the second edition which will undoubtedly be required before long. The index also could, with advantage, be lengthened. But these are small points and the book as a whole is very highly recommendable.

MARCH of SCIENCE

A survey of recent advances in the labs.

AMERICAN progress in the field of atomic energy was attested some time back by the launching of the world's first atomic submarine (see AUTHENTIC No. 45), and now America has given the world the first atomic battery. Designed and constructed by the Radio Corporation of America, the battery is not much bigger than a postage stamp and delivers one thousandth of a watt of power by converting nuclear energy directly to electricity. It is estimated that a small portable radio could be run for twenty years on ten of these batteries, and that in the not too distant future municipal power will be supplied by large replicas of this tiny battery.

Dr. Fritz Winckel, of the Institut für Schwingungsforschung, Berlin-Charlottenburg, has introduced a remarkable new tool into medical research. He began by designing

electronic apparatus for the scientific study of singing voices, and then found that diseases of the vocal chords and respiratory organs could be detected by careful study of recordings of the voice of the patient. He called in ear, nose and throat specialists, and together they worked out a diagnostic method based upon microphone recordings. It is claimed that analyses of these recordings have the documentary value of an X-ray photograph or electrocardiogram.

One of the basic tenets of scientific method is that everything—problem, experiment, explanation—should be made as simple as possible. A simple theory for unexplained phenomena is always preferred to a complex one. Yet scientists are fallible and very often they cannot help disregarding this fundamental principle. Thus it is that for quite a few years,

horticultural scientists have been seeking a cure for virus-infected raspberry plants. Many things have been tried, some of them quite complex. And all to no avail. Now, Dr. J. Chambers of the Scottish Horticultural Research Institute, Mylnefield, has shown that all you have to do is place the infected plants in warm air (35° C.) for a week or so. Who would think that a virile virus could be so easily conquered!

Time and again the problems of man are solved only by observing and learning lessons from the lower animals. During the war, the barrage balloon system was based upon the waving tentacles of *Hydra*, and the basic principle of radar has been used by bats since long before the first belfry was built! There are many other examples. The latest scientific development in gyroscopes is based upon the dynamics of the lowly *Diptera*—two-winged insects. Though gyroscopes are often used to maintain stability, the

Gyrotron—developed by scientists of the Sperry Gyroscope Company—functions as a detector of turning or yawing movements. And this is exactly the function of the *halteres*—modified hind wings—of the *Diptera*. By studying the action of the *halteres*, scientists were able to produce an electro-mechanical imitation which is more sensitive than any other instrument to turning movements. As yet, the device is still in the experimental stage, but it is expected to find application in high-speed aircraft and eventually to replace all existing gyroscopic systems. Perhaps the spaceship of the future will owe its stability of flight to the vestigial hind wings of a fly!

Scientists of the old school who worked with simple apparatus and yet made striding advances in science must often consider the present generation of researchers to be spoon-fed. Even in your editor's laboratory days apparatus was fitted together with corks and rubber bungs; nowadays the wonder-

ful Quickfit ground glass joints make the setting up of complicated assemblies an easy task. And it now seems as though that oldest chemical operation, the manipulation of a pipette, will join the ranks of nostalgic methodological memories. For Shandon, the progressive scientific instrument makers, have now put on the market a device—called a Pumpett—that not only sucks up liquids into pipettes but holds them there and lets them out at a steady rate. The rather crude control by a damped index finger is now replaced by precise and regulated apparatus.

The United States Department of Defence has issued a "Fact Sheet" containing the official news and views of Air Force investigators on flying saucer phenomena. The following are extracts from it: "The majority of sightings

could be accounted for as misinterpretations of conventional objects, such as balloons and aircraft. Others could be explained as meteorological phenomena or light reflections from crystallised particles in the upper atmosphere. Some were determined to be hoaxes. However, there still remained a few unexplained sightings.

"There are a small number of unexplained reports which involve a combination of seeing the object and detecting it on radar simultaneously. In each case the object appeared at night and had the appearance of simple lights.

"... special photographic equipment has been developed for distribution to selected air base control towers and Air Defence Command radar sites . . . As yet, no photographs from these cameras have been received."

Francis Bacon

by H. J. CAMPBELL

ONE hundred and sixty-six years before Sir Isaac Newton—of whom we gave an account in the last issue—died, Francis Bacon was born. It was upon the principles laid down by Bacon that Newton built his revolutionary system of scientific method. Perhaps the most important distinction between Bacon and his contemporaries was that Bacon refused to accept the authority of Aristotle's teachings and made no secret of it—a trait that characterised Newton also.

The world of scholarship surrounding Bacon looked to the writings of the past to supply answers to questions in the present, and all controversy was about what the ancients had said about phenomena—not about the phenomena themselves. Even the greatest minds believed that there was nothing more to

discover. The general opinion was that all the secrets of nature were somewhere in the writings of the old Greek and Roman sophists; the task of science, then, was to investigate these writings and thereby demonstrate the transcendental genius of the ancients.

Bacon's first and hardest task was to convince people that, although the ancients wrote dogmatically, they were not necessarily right, and definitely had not covered the whole extent of possible knowledge. Learning in Bacon's day consisted of mere reading, and to very little purpose. Bacon believed, and tried to make others believe—finally succeeding—that men could gain a tremendous amount of knowledge of the universe and a tremendous practical advantage from this knowledge.

He was the first to realise

that this knowledge could be gained only by observation and manipulation of phenomena. He was also aware that "neither the hand nor the intellect left to itself has much power; results are produced by instruments and helps, which are needed as much for the understanding as for the hand . . ." (*Novum Organum*, trans. by Kitchin. Oxford, 1855.) This was the first statement of the necessity of the experimental method in advancing science, and the first assertion of the usefulness of instruments. There was an appalling lack of any kind of specialised apparatus in Bacon's day; and not until this lack had been made good did real advances occur.

Bacon was, by profession, a lawyer. His phenomenological scientific ideas were far from accurate, an understandable state of affairs considering the depths of ignorance obtaining then. But he had some idea of atoms and elements, for he believed the universe to be composed of

separate bodies behaving according to laws. The bodies were supposed to exhibit such qualities as hardness, colour, odour, density, etc. It was by these qualities that we were aware of the bodies. As Bacon saw it, the business of science was to search beyond the superficial qualities and to discover the fundamental bodies.

Followers of the modern cult of semantics may be surprised to learn that Bacon recognised and gave rules for guarding against inaccuracies due to the misuse or misunderstanding of words. At times he was a little over-critical. He claimed, for example, that the Aristotelian syllogism was of no use because "it commands assent to the proposition, but does not take hold of the *thing*." This is invalid reasoning itself. It is true that the conclusion of a syllogism is dependent upon the truth of the propositions from which it is derived, but this does not render the syllogism useless. For we may know—by experi-

ment and observation—that the propositions are true, and the derived conclusion could then be used to form the basis for a whole series of natural laws. Bacon, perhaps, like many modern pseudo-logicians, rather overdid his scorn of Aristotelian doctrines!

It is from Bacon that we derive some of the first formulations of fallacies. The whole world, including Bacon himself, is guilty at one time or another of these fallacies, even today. Bacon calls them Idols and he divides them into: Idols of the Tribe, the prejudices to which mankind as a whole is prone, including the well-known device of ignoring all unfavourable evidence; Idols of the Cave, the peculiar biases that exist within each man individually and prevent his having an "open mind"; Idols of the Market Place, the errors of thought and understanding that occur through misuse or misunderstanding of words and phrases; Idols of the Theatre, the mistaken

tenets and doctrines of irrational systems that enter the mind under special emphasis, such as religion, childhood ethics, etc., and are almost impossible to eradicate.

Bacon agreed with Aristotle—for whom, as an individual, he had a high regard—that great masses of facts are required before any more fundamental progress can be made. But he departed from classical doctrine in that he considered mere observation of "natural Nature" insufficient. Controlled, designed experiment is also required. And that is Bacon's greatest gift to science—the idea of thinking out and setting up experiments that are expressly designed for some purpose. Today, this seems commonplace. In Bacon's era it made him appear a madman. Since his time, scientists no longer tried to understand the world by reading books. They studied the world itself. And they realise still that there is a great deal more to be known.

FANZINES

Reviewed by H. J. C.

I WAS very pleased to see the third number of *PERHAPS*, the Australian fanzine, mainly because I have sent the Editor, at his request, three or four articles and yet had not seen a single copy of the fanzine until this one turned up. Leo J. Harding, the Editor, and all other fanzine editors, should note that this is not the way to cement good relations with busy professional editors! We don't mind burning some after-midnight oil on behalf of serious fandom, but we do like to know that our work has seen the light of day. I haven't the faintest idea whether my earlier pieces were published, so I have not been sending any more, even though I was asked to do a regular column. Don't you think I'm justified?

Still, Australia is a long way away and maybe Leo has some kind of explanation.

When he sees this, he may let me know!

Anyway, *PERHAPS* is published from 510 Drummond Street, Carlton, N.3, Victoria, Australia, at, so it is said, "intervals of about every two months or thereabouts." It costs 1s. 3d. for single copies and 6s. for six issues—at least, those are the prices in Australia. They don't say how much in English money, though Americans can get two issues by sending one issue of an American science fiction magazine, or three for six issues.

The issue to hand has 43 pages, quarto, duplicated, illustrated, bound in a printed cover which has nice art-work on it. Apart from my own piece, there are articles and stories by Lyell Crane, George O. Smith, A. Bertram Chandler, Philip Jose Farmer, Walter A. Willis and some who are

not so well known. It's all good stuff, adult, sensible, to the point. *PERHAPS* is considerably better than most fanzines published in Britain, and would be able to join the upper ranks if it came out regularly and punctually. (I should add that No. 3 is the December, 1953, issue, which reached me at the end of March, 1954.)

DEVIANT is a new one on me. Carol McKinney, the Editor, sent me the first issue and I'm mighty impressed by it. Large-size, 35 pages, well duplicated and illustrated, crammed with all sorts of features that you do not usually see in fanzines—it costs 15 c. a copy or 40 c. for three, in the U.S.A. and Canada. British fans—and others outside the new world—can get it by sending one British science fiction magazine or pocket-book per copy to Michael Birrel, 10 North Street, St. Leonard's-on-Sea, Sussex. (The editorial address is 377 East 1st North, Provo, Utah, U.S.A.)

A warm welcome to this newcomer and all who are associated with it. It is the most "English" of any American fanzine, and I rather fancy it benefits from that—without my being in any way nationalistic. The benefits are in maturity and straightforward common sense rather than the bouncing, childish pseudo-humour found in so many Stateside fanzines.

SCIENCE FANTASY BULLETIN, though no longer being published, is not dead. According to its Editor, Harlan Ellison, "it has metamorphosed to *DIMENSIONS!*" SFB was a bumper job that must have taken a great many toiling hours to put together. Harlan is now at Ohio State University and cannot find the time to put out a mammoth fanzine. So he is putting SFB in cold storage for a while and keeping in touch by issuing a smaller publication called *DIMENSIONS*. Details of this latter fanzine are not yet settled, but it is claimed that *DIMENSIONS* will be even better than SFB.

Anyone interested should write to Harlan Ellison, 41 East 17th, Columbus 1, Ohio, U.S.A.

The seventh HYPHEN has emanated from Walter Willis of the tireless pen—who lives at 170 Upper Newtownards Road, Belfast, N. Ireland. This issue is noteworthy to me for its very fine reviews of *Authentic* and of my anthology, *Tomorrow's Universe*, by Bob Shaw. Bob shows himself to be a man of deep perception! However, I did read the rest of the fanzine, and found the material as excellent as it usually is in this publication. The accent, also as usual, is on humour—of a quiet, subtle kind that knows no kin with custard pies. There's little one can say about HYPHEN except that all serious fans should subscribe to it. You can get it from the

address given above at 1s. 6d. or 25 c. for two issues. Do that.

Still going as strong as ever in its 13th year of publication is FANTASY TIMES, the oldest science fiction newspaper in the world. It comes out fortnightly and gives all the news of developments in the professional field as well as dealing with the highlights of fan activities. Published by James V. Taurasi from 137-03 32nd Avenue, Flushing 54, New York, U.S.A., it costs 9d. (10 c.) a copy. Or 15s. a year (\$1.00 for 12 issues). British fans can save time by sending subscriptions to the Milcross Book Service, 205 Brownlow Hill, Liverpool 3.

That's all for now. Next month I'll be reviewing more fanzines. If you want *yours* noticed, just send me a copy.



Projectiles

OVERSEAS SECTION

STORY TYPE

Just what kind of science fiction do you like? In the end there seems to be two or three main types. Human interest, "Foundation" and psychological studies. The first part wasn't invented until the late 'forties, but the popular deeper space school came in under E. E. Smith and Edmund Hamilton in the 'thirties. But they remained—to become popular under the pen of Asimov. These stories lack human interest—such as is found in Judith Merril's *Shadow on the Hearth*. Although the old stories weren't too well written, they seemed to have a certain "This is for real, bud!" air to them. Many modern stories lack this. Psychological stories take in quite a bit of science fiction—very rarely is a novel good

without having a moral, or at least, a few pointed comments. But psychological isn't the right name for them. They seem to be the authors' views on certain subjects. Every now and then some author has some views which must have taken some thought on the rest of the human race, but not often.

James Seusier, Route No. 4,
Trenton, Tenn., U.S.A.

Now what exactly are you getting at, Mr. Seusier? In answer to your first question—we like all kinds of science fiction.

SAUCERS

I would be deeply indebted to anyone who could send me data on flying saucers. I make this request because I am in possession of some excellent authentic photographs of these strange craft. I say craft because I am really convinced that we have been honoured with a visit by intelligent beings from another

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world. The Saucers have been sighted in many parts of New Zealand, and many of the sightings have been really spectacular. I myself have seen three of them, and they are identical to the photographs I have in my possession.

Denis W. G. Saunders,
11 Fifeshire St., Tālāpuna W.2,
Auckland, New Zealand.

No doubt some of our readers will rally round, Denis. We know that many of them are intensely interested in flying saucers. We would suggest, though, that there is not yet enough evidence of any kind—for or against—to justify firm belief or disbelief in the reality of these phenomena.

COURAGE!

For a long time now I have been reading your "projectiles" column and I have been trying to pluck up courage to write. You know, after I read my first *Authentic* (No. 29), I had half a mind to ask my bookseller for a refund. However, I stuck to it. Well, need I say more? The way your magazine has improved over the past few issues is symbolic of a rocket-ship taking off. Slowly at first, but finally rocketting on towards perfection at the speed of light. I want to tell you truthfully that *Authentic* is now my most prized collection of magazines. Anyway, keep up the good work. I have just joined the British Inter-

planetary Society and I think your articles just the thing for promoting public interest in space flight.

Galvin L. Edser, c/o N. Benge,
Main Road, Upper Hutt,
Wellington, New Zealand.

*Your praise overwhelms us, Galvin!
But we are very pleased you like us.
Do write again, please.*

HIT AND RUN

Having two young children, I read mostly on a hit and run basis. Also I make nearly all our clothes, and that takes up quite a time! I, therefore, enjoy short stories more than full-length novels—and the less complicated, the better! All the long words and strange phrases leave me cold. I read for enjoyment; if I want an education on scientific jargon I can go to night school and get it.

Joan Windsor,
R.R.1, Hurdman's Bridge,
Ontario, Canada.

Nice to hear from you, Joan. We wish you could put more time into your reading, for if you miss out on novels you are forgoing a lot of pleasure. We agree with you about long names, though often they cannot be avoided.

AUSSI CLUB

My science fiction club, the North Shore Futurian Society, is still grow-

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ing. We now have seventy members and 725 items in our library. We have twenty-nine *Authentics* and are still filling in our back numbers. We operate a postal library with members in Australia, and correspond with anyone who wants to write to us from overseas. Sydney fans, who are now preparing for the Third Australian Science Fiction Convention, have now got their own club rooms. Meetings are held every Thursday night and also on Saturdays. On Monday nights, the rooms are used for auctions, debates, talks, etc. One thing I would like to ask you—how about having a page or two in *Authentic* containing news or articles on fan clubs throughout the world?

Michael Bos, 24 Spencer Rd., Killara, Sydney, N.S.W., Australia.

That's wonderful progress, Michael, and we're very glad indeed that you wrote and told us about it. We take a great interest in fan affairs all over the world—which makes us think that your idea for a regular club column is a good one. We will run it from the next issue—and it will be up to fan clubs everywhere to keep us supplied with news of their doings.

FAIR

... the article on ESP was very informative and fairly unbiased, which is unusual in such articles.

Your answers to "Projectiles" are usually quite fair . . .
Bruce Whitefield, 34 Dover Rd., Rose Bay, Sydney, Australia.

No comment! Except: Thank you for a very nice long letter, Bruce.

(Many other overseas letters are being held over until the next issue, due to lack of space.)

HOME SECTION

NESFS

In my letter which appeared in *Authentic* No. 38 I called on science fiction fans in the north-east to form our own society. I am now pleased to say that the North East Science Fiction Society is now in operation. We have quite a large number of members, and regular meetings are being held at the Lampton Arms, Chester-le-Street. The only person to answer my letter was Mr. G. E. Mason of 24 North Terrace, Mount Pleasant, Birtley, Co. Durham. From that point, we discussed, via letter, what form the club would take, meetings, etc. Then Mr. Mason got down to the hard and tedious task of digging up local fans. In time he contacted thirteen fans, and through them others were made known. Mr. Mason is the President of the Society. At my end I was busy arranging a fanzine. This goes into

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publication towards the end of April. Christened *Science Fiction Satellite*, the fanzine will contain articles and stories by local fans, news of fan activity, and a few contributions by professional authors. It will be fully illustrated and will be edited and produced by myself.

Don Allen, 3 Arkle Street,
Gateshead 8, Co. Durham.

Hearty congratulations, Don and Mr. Mason. You've done a fine job of work and we hope your Society flourishes. Don't forget to send us news from time to time. And we'll review your fanzine when it appears.

SUPREMACY

As an "apprentice" scientist, I take a great interest in modern science fiction. At home—Newport, Mon.—we have a small circle of fans, mostly university graduates or sixth form scientists. We consider *Authentic* to lead the field of British science fiction by about three years, and it compares favourably with most of the American magazines. You have several points which give you a certain supremacy over the other British magazines. The first of these is the articles you produce on scientific topics. Mr. Campbell has made one slip in his discussion of the silicon-based metabolism. This is that he has replaced carbon dioxide—a gas—with silica, which

is a solid with a very high melting point and a very low solubility. Plants attempting to take it in would have extreme difficulty in so doing, as would animals in breathing it out. Your second favourable feature is the collection of letters printed each month. There is a welcome lack of folk who wish to have Einstein's theories explained in simple, non-mathematical terms, a virtually impossible task. These, combined with your usually high quality stories, go far towards making *Authentic* a great magazine.

Michael Parsons,
Royal College of Science,
London, S.W.7.

We are glad you like our articles, Michael. There was no slip with regard to silica; naturally, both silica and silicon itself would have to be assimilated and eliminated in ways very different from the ways in which terrestrial organisms do so. The silicon form of life would not be based on gaseous exchange. Thank you for your compliments, and do let us hear from you again.

TOO COMPLEX

As an adherent reader of your renowned magazine, may I air the one and only grievance I have? Your cover picture is excellent, your shorts are good, but, oh dear! those long stories! To us, the old hands, the stories are comprehen-

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sible, but the authors fail to produce the desired material fitting to the beginner. The resultant effects—no new readers.

Allan Brown, 221 Caledonia Road, Glasgow C.5.

We thank you for your solicitude, Allan, but we fear you are wrong. Certainly we've had no letters from "neofans" complaining about the complexity of our long stories. And we do get new readers—all the time. We do not believe that beginners need to be spoon fed with sloppy science fiction. We think they can take the best right from the start—and our readers confirm that. Still, you're all right!

WORST ISSUE

Will you permit me to make a few observations on issue No. 42 of *Authentic*? In my opinion it was the worst collection I have ever read. Does that shock you?

L. J. Monk, 91 Carisbrooke Avenue, Bexley, Kent.

To be quite frank—no! After reading several thousand readers' letters, nothing could shock us. And, of course, lots of people do not agree with you. Nevertheless, your comments have been carefully studied. We thank you for them and hope you will do it again.

SIP

You may be interested in the Southport Interplanetary Society, a recently-formed group of science fiction and astronomy enthusiasts. Despite generous help from one of the town's big newspapers, publicity is our headache. A paragraph in a wide-selling magazine would introduce more members—male or female; we have both. Please could you help us out? Fans in this district should contact Mr. R. Butler, 143 Railway Street, Southport, or myself.

John Ashcroft, Manor House Farm, Halsall, Nr. Ormskirk, Lancs.

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AS HEALER. One Lady writes: "My sister suffered very badly for years, but since I gave her a Joan the Wad to keep near her she is much easier. Do you think this is due to Joan or the water from the Lucky Well?"

AS LUCK BRINGER. Another writes: "Since the war my wife and I have been dogged by persistent ill-luck and we seemed to be sinking lower and lower. One day someone sent us a Joan the Wad. We have never found out who it was, but, coincidence if you like, within a week I got a much better job and my wife had some money left her. Since then we have never looked back and, needless to say, swear by 'Queen Joan'."

AS MATCHMAKER. A young girl wrote and informed me that she had had scores of boy friends, but it was not until she had visited Cornwall and taken Joan back with her that she met the boy of her dreams, and as they got better acquainted she discovered he also has "Joan the Wad."

AS PRIZEWINNER. A young man wrote us only last week: "For two years I entered competitions without luck, but since getting Joan the Wad I have frequently been successful although I have not won a big prize. But I know that . . . who won £2,000 in a competition has one because I gave it to him. When he won his £2,000 he gave me £100 for myself, so you see I have cause to bless 'Queen Joan'."

DO YOU BELIEVE IN LUCK ?

HURRY

Mrs. WILSON, of Falmouth, says, 1951:
Since receiving Joan the Wad . . . my husband's health has improved 100%

JOAN

Mr. Jones, of Cheltenham, says, 1951:
. . . Send me J. O'Lantern.
Since receiving Joan the Wad have won two 1st prizes in Crosswords . . . John Bull and Sunday Chronicle.

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AS SPECULATOR. A man writes: "I had some shares that for several years I couldn't give away. They were 1/- shares and all of a sudden they went up in the market to 7/9. I happened to be staring at Joan the Wad. Pure imagination, you may say, but I thought I saw her wink approvingly. I sold out, reinvested the money at greater profit and have prospered ever since."

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shows something that will probably not be a rare event on the journey to the stars—an emergency!

The engines—ion-drive accelerators, have been working continuously for anything up to a couple of hundred years, and now something has given up under the strain. Immediately, repair crews go into action. Protected by spacesuits from the vacuum outside the ship, they swarm over the motors that lie in a long cylinder down the centre of the ship. They work fast, for time is an important factor on this trip. Even with constant acceleration, the ship will not reach its destination until several hundred—maybe a thousand—years after its departure from the solar system. A drop in acceleration for even a short time might add a century or two to that period!

So while one squad of men tear out the covering panels and dismantle the defective units, other squads are busy bringing up spares all ready to be inserted into place with the minimum of delay.

One of the amazing things about this ship is that its motors are cannibals! They will eat themselves: or most other things for that matter. As parts wear out they are removed and replaced by spares, and then the broken units are fed into the motors and torn apart into the very ions (charged atoms) on which they are made.

Thus, the heavy motor units are not a dead loss to the ship even when useless for their primary purpose, for they become fuel for the parts which have replaced them.

Soon, the repair squads will have finished their task, and will climb back into the safety of the gigantic ship. Maybe another century will go by before the motors need attention again. But by then the ship will be approaching another star system—a long way from home.

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